The Reader Writes:—

Embarrassing Questions

May I make a suggestion? There is plenty of propaganda issued about the TVA experiment, but I find it impossible to get facts about their fertilizer program, and what it has accomplished to date. Dr. Curtis, at the Engineers' meeting, failed conspicuously to get down to brass tacks. All I can find is rumors. Can you get any actual data on the real output of the two electric furnaces now said to be in operation? How much superphosphate has been made? Of what grade is it? Where has it been distributed? Is it true that the TVA is subsidizing to the extent of $5,000 the state experiment stations in their territory to propagandize the use of triple superphosphate? Is this expenditure to be charged on the yard-stick basis against the cost of manufacturing fertilizer at Muscle Shoals? What has it cost anyway?

I have endeavored sincerely to get answers to these questions through official channels, where they are either treated as impertinences or simply ignored. It seems to me that the fertilizer industry and the country at large has a right to know these facts. It would be a fine job if you could uncover them.

St. Louis, Mo. MARK C. LITTLE

Neither Political Nor Professional, If You Please!

I like your magazine tremendously except for the fact that you are apparently very strongly biased politically. Such an attitude is, in my estimation, untenable in a technical magazine designed to serve professional men regardless of their political affiliation and beliefs.

New York City. HUGE KLEIN

Adding Interest to Value

I get more of interest and value out of CHEMICAL INDUSTRIES than from any other chemical magazine.

Portland, Me. HERBERT ALLEN

The High Cost of Taxes

Our tax cost in production will certainly be materially higher when we start paying for the New Deal. The money required for debt service will be greater. The base for taxation has shrunk from the retirement of perhaps 20 billion dollars from taxable investments into untaxed government bonds, and our price structure is seeking a lower place to come to rest. When a government borrows and sells tax-free bonds it burns the candle of prosperity on both ends. It reduces the remaining taxable wealth at the same time that the demand for tax money must be increased. For this reason government debt is twice as bad for the people as private debt of equal volume.

Furthermore, the country is losing wealth at the incredible rate of about 25 billion dollars a year or possibly almost twice that. The value of all American railroads is approximately 22 billion dollars which required the better part of the surplus savings of a hard working people 50 years to provide. This estimate does not include many important things as the depletion of natural resources of forests, soils, oil, coal and ores, nor oral losses.

The gold legislation has not solved this matter. The country suffered the ignominy of devaluation or partial repudiation, without any worth-while offsetting advantage. Other countries, as Japan and England, have depreciated currency but their nationals are not outlawed from the gold and silver markets and they do not have, I believe, the disadvantage we have, of a non-interchangeable currency. Beside seeing our national wealth reduced at an unprecedented rate; the creation of heavy loads of public debt; credit as an aid to production hamstrung by unnecessary money uncertainties: the disappearance of the peoples' savings at an accelerated rate from the added demands of NRA and AAA, etc.; our agriculture reduced so low that likely we shall have to buy food on balance and send money to provide it out of the country, money that we will sorely need to support our price and debt structure; and the demoralization of the people, we have besides unnecessarily cut some 8 billion dollars from the face value of foreign debts owed here. We are not only getting poorer nationally and individually, but the means by which we could save ourselves seems to be all headed off. One reads reassuring news, but people who think at all are unconvinced in their concern caused by this obvious shrinkage in wealth. During the World War, we suffered staggering losses from unsound credits abroad. But we produced this lost wealth and did not really impoverish ourselves. In effect we gave away a surplus created by feverish activity. Now the government is borrowing comparable to the war-time borrowing rate and it is really destroying capital wealth this time. Ten million idle, with all the corresponding equipment and facilities also idle, should perhaps be estimated at $5 per day lost per person or 45, not 25 billion dollars a year.

Demagogs and unsound economists cry for a fairer division of produced wealth. What we need is far more production. Distribution will take care of itself: nobody produces goods to look at.

We need to undertake a desperate battle to stop these losses and beat down the tax costs hidden in the prices consumers must pay. Our costs for taxes alone are higher than world prices. If the tax costs alone are higher than the World market prices, and our producers cannot reach a natural production cost under zero, why be surprised that we are so largely cut off from foreign trade? Where we have any left, it is just a disappearing remainder as the curtain is being drawn down on America, compelled, or bluffed into, worshipping the great god BALK, as demanded by his high priests.

Weaverville, N. C. ANSON G. BETTS

At Least We Own a Bible

The "reading interest" of your magazine, concerning which you inquire, would be increased for me if there were fewer biographies of big little men and an omission of most of their portraits which, certainly, do not lend themselves to decorative purposes. Of course, this is no blanket indictment for some few of them are well worth hearing about.

A careful reading of your editorials has convinced me that you use your family Bible chiefly for pressing flowers rather than for ethical purposes, and that view has been confirmed by the June reference to a *"biblical"* admonition to "make two blades of grass grow where but one grew before." The great poets, philosophers and seers who wrote that book failed to invent that one among the other gems they produced and left the credit for a later theologian, who gave it as his opinion in the "Voyage to Brobdingnag" that "whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve more of mankind and do more essential service to his country, than the whole race of politicians put together."

But, of course, I would not be resubscribing but that I find the excellencies of your publication more than balancing these criticisms.

Bovina Center, N. Y. HOWARD B. GOETSCHIUS

CHEMICAL INDUSTRIES

VOLUME XXXVII NUMBER 1

Fact Finding

TO continue N. R. A. as a fact finding body may be the best means of saving the Administration's face from a political point of view; but as a solution of the problems stirred up by this experiment, it is just about as bad as it can be. Collecting dubious data on debatable facts is a roundabout and unsatisfactory way of arriving at sound conclusions. Unless carefully planned and carried through with the deepest devotion to the truth, its results will be worse than useless.

The record of the Roosevelt Administration inspires no confidence in its sincerity and disinterestedness. It has been caught red-handed—and more than once—juggling statistics to prove its own case. It has been extremely intolerant of criticism, and too often its only answer has been vilification of its critics. Accordingly, there is little hope that "fact finding" under N. R. A. auspices will be a sincere effort to find the facts.

Developments to date justify this gloomy outlook. The ink was not dry on the Supreme Court's N. R. A. decision before code authorities were bombarded with requests "to telegraph at our expense" any cases of wage cutting or hour lengthening. Examples of the maintenance of code labor conditions were not requested. The Washington publicity mills have been grinding out detailed stories of code violations. There has been no similar publicity given to the actions of many trade associations to keep code provisions. The old hue and cry against the chiseler has been raised; but no official commendation of the price cutter as the benefactor of the consumer has been broadcast. There are two sides to most questions raised by N. R. A.; but apparently N. R. A. itself is concerned only with one set of facts.

And the pity of it is that the country sorely needs these facts. Serious problems depend for their correct solution upon the good judgment, the toleration, and the vision of the American people, and never before were prejudice, privilege, and self-interest more rampant.

Praise and Thanksgiving The Chemical Alliance, Inc., having a second time served the industry in a period of great need, has been put aside and the regular trade associations take up again the full burden of their labors for the different divisions of chemical production. But the Alliance is still wisely kept in stand-by condition, ready for a third time should all chemical producers again need one common representative, to serve as organizer and spokesman. The prophetic wisdom of its war-time officers is thus confirmed by its present leaders. It is very proper, at this time, to give those leaders the praise and thanks they so richly deserve. Good judgment, backed by patience and toleration and guided by a rare practical understanding of actualities, enabled them to lead the chemical industry through a maze of laws and regulations with very conspicuous success. We have only to witness the plight of other great industries which leaned too heavily upon a code to maintain prices or curb competition to appraise the value of the services rendered by the Executive Committee of The Chemical Alliance.

The Rising Tide of World Prices During the first half of 1935 there have been but few important changes in the chemical price list, and the published averages show naturally only a fractional advance. This is a curious and unique phenomenon; and in view of the many and various and vigorous expedients adopted by our Government deliberately to raise prices, it provokes inquiry into the debatable sequence of cause and effect: Have chemical prices been stable because of the well recognized stability of chemical consumption, or has this stable consumption resulted from stable chemical prices? Here is a puzzler in chemical economics that plainly belongs with the classic problem of the hen and the egg.

Nevertheless, it is especially interesting to us in the chemical industry to compare the wholesale price indices of the United States and other industrial countries and to check these figures both with foreign chemical price averages and the extremely divergent objectives of the various governments. On a comparable, international basis these figures for the first quarter of this year are now available.

In this country, during that period, the index of wholesale prices rose 13 points higher than the average of 1933, and chemical prices are up 2 points. In Canada, where the Government, in violent contrast to our own, is sharply criticized for "having done nothing," wholesale prices are 5 points above the 1933 average and chemical prices have dropped back less than one point. In Great Britain the effort has been made, not to raise prices, but to check the deflation of all values, an effort executed with great circumspection and chiefly through monetary controls, with the result that British wholesale prices at the end of March stood exactly one point above the 1933 average, and chemical prices, as in Canada, are fractionally lower. In Germany, Italy, and especially in Japan, the rising cost of living has of late inspired conscious attempts to apply brakes to advancing domestic prices. Compared with the average of 1933, wholesale prices in Germany and Italy are 8 points higher and in Japan 4 points higher. Chemical figures for Italy are not available; but in both Germany and Japan chemical prices have advanced roughly half as much as the general average.

In industrial countries off the gold standard prices have been advancing during the past two years. Chemical prices have advanced very slightly in the United States and in Canada and Great Britain show fractional declines. In Japan and to a lesser extent in Germany and Italy chemical industries have been the recipients of government favors, and there chemical prices have risen, but only half as much as the average of all prices. We suspect that without political influence and contrary to the general trend of prices, chemical values would decline proportionally to technological advance.

Two New Sales Opportunities Three important chemical sales jobs have been well done. The American Chemical Society has "sold" research to the American people with gratifying results. The Chemical Foundation has "sold" the chemical industry to Congress which now appreciates the full meaning of our products to national security and national prosperity. The American Chemical Industry itself has "sold" chemicals to Wall Street. There remain two other important chemical selling jobs. Our teachers of chemistry need to be "sold" practical chemical business, and our economists and statisticians should be "sold" on industrial chemistry.

Bessemer steel, aluminum, machine weaving, and other earlier industrial advances were exploited without exploiting the public and reduced rather than increased the cost of living. Mural by Thomas W. Benton. Reprinted with permission of The New School for Social Research.

Nelson Littell

tells the rules of

Playing Poker with Patents

THE present century has witnessed the birth of a new game in business, which might well be called "playing poker with patents." There are no fixed rules—nor do the cards have a given value. It is more fascinating than contract and swifter—but very few have mastered its technic.

Prior to 1900 the United States Patent Office had granted only 640,166 patents; since that date approximately 1,300,000 have been granted and new grants are being made at the rate of approximately 40,000 patents per year.

Among the uninitiated there is a prevalent impression that most patents are not worth the price of the ribbon and seal under which they are issued. Some are valuable and some are not, the value of any patent is uncertain and the opinion of the best counsel is often only a guess. Many novices are drawn into the new game of "patent poker" to their sorrow. Some have beginner's luck and amass fortunes by a "luck hand" in this business game.

During the 19th century, business as a whole took little stock in patents. The farmer paid his toll on patented farm machinery and the housewife welcomed the sewing machine because both took part of the drudgery out of laborious tasks and returned a direct profit to the user. The telephone and telegraph, together with improvements in railway transportation knitted the world closer together and no one would question that the public gained more than the patent owners. The patentees gave more than they received.

Only outstanding improvements were patented however, and a patent policy, as such, did not exist in most corporations. Machine-made shoes, and vulcanized rubber were welcome advances of unquestioned merit. These, together with aluminum, machine weaving, Bessemer steel and other industrial advances, were ex-

ploited without oppression to the public—and reduced rather than increased the cost of living.

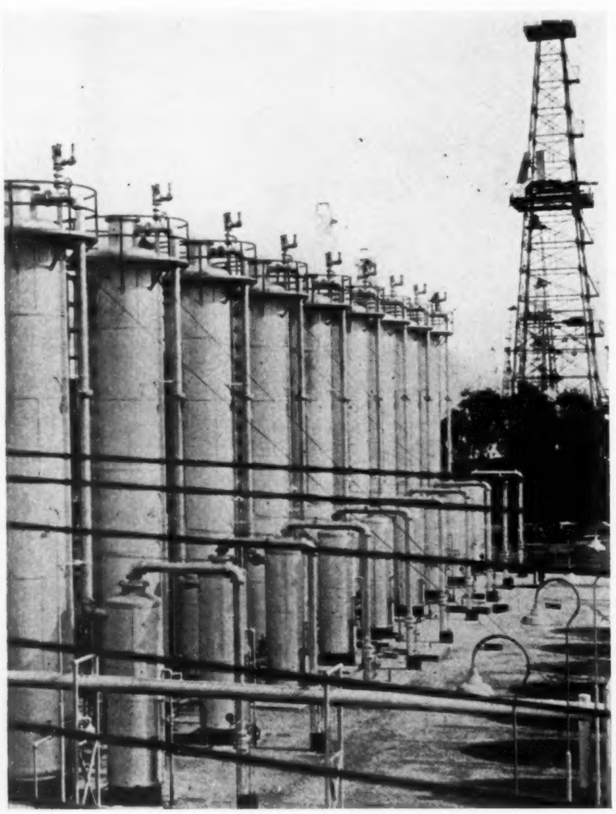
The oil industry, meat and food packing, tanning, railroading, chemicals and pharmaceuticals manufacturing, proceeded without patents except in minor instances, and small competitors were either stamped out by ruthless competition, as in the oil industry, or were bought out or merged on the basis of their going value.

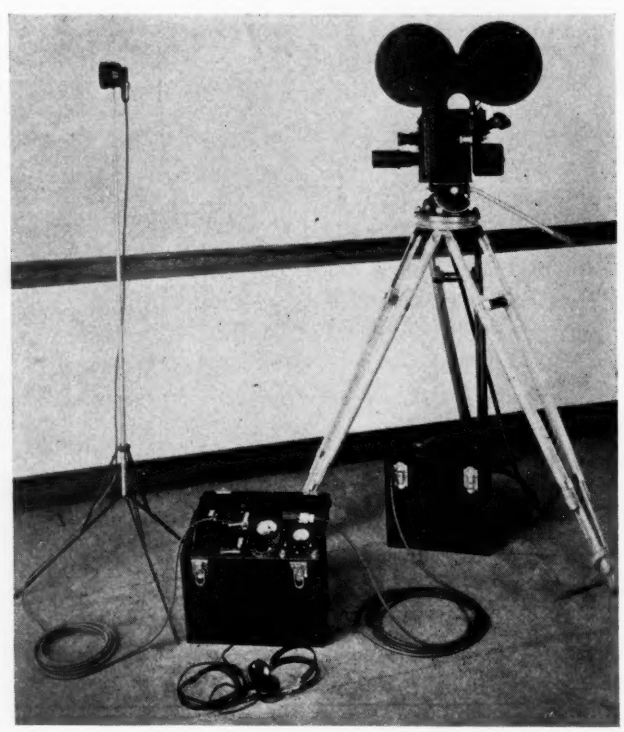
Business as a whole had no conception of the potential value of patents or how to use them. The American Telephone and Telegraph Company, The Aluminum Company of America, and The United Shoe Machinery Company built up perpetual monopolies by far-sighted patent and business policies and development programs. But the telegraph, most farm machinery, the sewing machine and the talking machine, became public property as these patents expired.

Today many of the inventions are not so outstanding. The increase in mechanical, chemical, and electrical skill and knowledge among the people at large and the increasing number of prior patents, as well as the increasing use of mechanical and electrical effects make slight advances seem important. Slight improvements in the shop or research laboratory, slight changes in chemical practice and improvements in the commercial purity of a product or a decrease in its cost of production—things which would have passed unnoticed as ordinary steps of a day's labor fifty years ago—are now being patented and these patents exploited with skill and daring which would have shamed the shrewd business tactics of the oil barons and the railroad kings of the Gay Nineties. Captain Kidd or Jesse James would have blushed at taking the sums—which the new patent poker sharks take from the public on minor improvement patents, on nearly every hand that is dealt. Even the security companies base many of their issues on the patent strength of the venture represented by the stock issue.

As the forward pass in football has put the little college on a par with the big university, an intelligent patent policy skillfully played often puts the little business on the same footing as its bigger competitors. It is no longer possible for the big fellow to squeeze out the little fellow, if the little fellow has a fundamentally sound patent situation on products which purchasers want, and which the big fellow therefore cannot make without permission of the patent owner or risk of patent infringement suits. Patents are now often the ace in the hole—in mergers, where the big company takes over the little competitor and pays handsomely for the privilege of doing so. Fifty years ago the little company would have been harassed by price competition and strong arm methods into a position where it could be forced out of business or purchased for a song. Now with the aid of patent protection the little company is often in a position to dictate its own terms to a financially stronger rival.

How is this fascinating game played? Around the boards of business trading; and the individual players often move in the background, and are unknown to each other. They are shrewd and far-sighted, traders and bluffers, backed by able research staffs and advised by a retinue of patent lawyers and solicitors. There is a great deal of bluffing since the cards have no fixed value. Sometimes a bluff is called, patent litigation results and in the showdown the courts sustain or break





The public pays tribute on every gallon of cracked gasoline and on every movie ticket.

the patent. But, more often, even a bluff succeeds, as it is more profitable for the threatened manufacturer to recognize a plausibly sound patent situation and pass the burden of maintaining it on to the public—than to spend thousands of dollars in defending patent suits and then find: (1) If he loses, that he is practically forced out of business by the injunction and heavy accounting levied against him; and (2) if he wins and breaks the monopoly that he has merely opened the market to an inrush of cut price competitors who unscrupulously take advantage of his courage and monetary outlay in calling the bluff, without sharing in his expenses.

Sometimes it is only a two handed game, with the public a silent third player, having a stake, but no cards—one player may hold all the good cards with which to bluff, call or trade, the other player having neglected to build up a patent hand, finds himself in a defenseless position. The public is a silent supporter of the game and no matter who wins the public may lose.

More often many players, representing many industries, sit around the table all with patent cards of more or less value. They bluff and call, and finally pool and divide the pot, according to the strength of each hand. A single patent skillfully played may prevent exploitation of the results of years of research which have resulted in several patented inventions, but the holder of the blocking patent may often dictate his own terms to the holder of the larger if not stronger patent hand. Patents taken out as a matter of policy and not in commercial use often have defensive strength in protecting the owner against suits or threats of suits. Some players recover merely the "ante" of their corporation and emerge with a free license, others lose their ante and must contribute royalties to the pot while the strongest hand takes all or the major portion, and the royalties, by means of further pools, restrictive licenses and improvement patents, run on and on—although the basic patents expire.

The Part the Public Plays

The public pays the tribute on every gallon of cracked gasoline, every automobile tire, every pair of silk hose, every movie ticket, every electric light bulb, and every radio, and the numerous patents in these fields are so intertwined and interlocked that with central control of improvements, leasing of equipments, etc., the monopoly runs on forever although in theory the patents expire at the end of seventeen years.

The talking picture manufacturers and exhibitors will pay perpetual royalties to an electrical industry in the form of an annual rental on perpetually leased equipment. The contracts call for assignment of all improvements to the lessor. Radio manufacture, oil refining and portions of the automobile field are so entwined with overlapping patents that if a manufacturer in these fields recognized all the patent claims, he would be paying royalties far in excess of his possible profits.

Nelson Littell, senior member of the firm of Hammond & Littell, has been practicing patent law in New York City since 1923. He graduated from Purdue in 1919, class of chemical engineering, and after serving during the war and in the Chemical Warfare Service, entered the U. S. Patent Office as a member of the Examining Corps.

Manufacturers often not otherwise interested in patents are forced to adopt a patent policy and, by purchase or development, to secure a hand in this new game—for the mere protection of their business from demands of the patent poker sharks. A long range patent policy in which new applications are filed, new patents secured, and outstanding patents purchased, soon results in a winning hand. A comparatively new corporation practically monopolized the automobile brake business in a period of less than five years time by the use of good business judgment and an aggressive, well-directed patent policy.

Participants in the Patent Game

The new game is not played by amateurs; but by capable business executives, backed by the resources and accomplishments of large manufacturing enterprises employing research staffs, patent counsel, etc., and who seek by this means not only to control prices and competition but to take from their less alert competitors a large portion of what would otherwise be the profit of the competitor. Many businesses pay thousands of dollars in patent royalties—as the penalty of being drawn into the new game without having a patent policy with which to build a "hand" on which to call or bluff the more alert rival.

On the other hand few new business ventures are started without patent protection. Our business gamblers will often back a new idea, supported by a poker hand of patents, courageously and bountifully. Without the poker hand, the business would never be started. Few men will put $500,000 to $1,000,000 into a new venture or an extension of their old business without some assurance that they can prevent competitors from coming in and profiting on their initial development, as soon as the venture proves successful.

The bet of a new venture is often in the poker hand of patents, and it is here that faith and courage are placed, after cost and sales statistics have reached the limit of their usefulness.

Without new business ventures and financial courage to back them, partly based upon patents, we can make no progress. The development of the automobile industry, with its attendant demands on the metal, oil

and rubber industries, the development of the radio, the motion pictures and the talking pictures and aviation, have brought successive waves of prosperity to this country. All of these were, in the beginning, based on patents and originally financed in reliance on patents, basic or otherwise, which would give the backers some promise of a protected return on their investments.

The line of legitimate and illegitimate use of patents cannot be sharply drawn. Neither Congress nor the courts can safely define in advance the conditions under which the use of patents should be restricted, in view of the legitimate use in many instances to develop industries and products which would never be produced except under the protection of a patent hand.

Consequently, the game continues and grows, either by popularity or necessity. The man developing a new industry needs patents to protect his investments in development costs from unscrupulous competitors eager to rush in as soon as he has shown the field to be profitable. The improver of an old industry, be he large or small, needs patents to protect his advantage over his less progressive competitor, and the man who neither hopes or expects to profit from new developments, needs patents to protect himself from unexpected demands made upon him, because of unwitting and unintentional treading upon his competitors' toes.

If each man played his own hand only, the immediate players and the industries represented would be affected, but after one hand is dealt, and the calling and bluffing is over, the players often decide to pool their cards in the hand of one player and invite a new group to take the seats of the players who have withdrawn. This new group together with the silent public finds the cards stacked and usually loses. And therein lies the evil of a patent system which has contributed very largely to the industrial progress and greatness of this nation.

Industry's Bookshelf

German-English Chemical Terminology, by Alexander King and Dr. Hans Fromherz, 324 pages. D. Van Nostrand Co., 250 4th Avenue, N. Y. City. $5.

This book is a very comprehensive introduction to chemistry, in English and German. It gives the exact definitions of those terms in common use in the science by presenting each one of them in a suitable context and thus making the meaning clearer than could be obtained by the use of the dictionary.

Challenge, by Upton Close, 408 p. Farrar & Rinehart. $3.

Good, red-blooded reading that convinces you the Japanese are real people and interests you in what they are doing, and how, and why. Guaranteed not to bore you, and very likely to give your thinking a new turn. Highly recommended for summer reading for any chemical man.

Problems In Industrial Purchasing, by Howard T. Lewis, 498 pages. McGraw-Hill Book Co., N. Y. City. $5.

A most noteworthy attempt to set down in black and white that which the experienced purchasing agent has acquired through a painful apprenticeship. Through case histories the fundamentals are brought to light in a novel and illuminating manner. The book is one that all dealing with purchasing problems can read with a maximum of benefit.

Handbook Butane-Propane Gases, edited by George H. Finley. 375 pages. Western Business Papers, Inc., 810 S. Spring st., Los Angeles. $5.

This is the 2nd edition of this authoritative book on liquefied petroleum gases. Contains complete engineering and production data. It is the "bible" for those actively engaged in this field. For consultants and engineers who are at times called upon for technical advice it provides a wealth of material easily and quickly obtainable.

The Analysis of Financial Statements, by Harry G. Guthmann, 584 pages. Prentice-Hall, Inc., 70 5th ave., N. Y. City. $5.

The modern executive in the chemical industry will find much in this book that is enlightening on a subject that is very vital. It will prove an aid to a better understanding, not only of his own business, but also in making intelligent investments. It provides background on a subject that is one of the most popular subjects of 1935 conversation.

Fundamentals of General Chemistry, by Perry A. Bond, 411 pages. Farrar and Rinehart, N. Y. City. $3.

The author prepared this general chemistry textbook for colleges because he felt that the time had come for a rearrangement of subject matter so that emphasis might be placed upon the fundamentals of theory and of law with descriptive chemistry as example rather than as prime object.

Modern Shoe Dressings, by W. D. John, 153 pages. R. H. Johns Ltd., Director Press, Newport, Mon., England. Chemical Publishing Co., 175 5th ave., N. Y. City. $5.

An authoritative survey of the various raw materials employed; the manufacture and application of shoe polishes. Contains a chapter on shoe cleaners and special cleaning reagents.

The Nitrogen System of Compounds, by Edward Curtis Franklin, 335 pages. Reinhold Publishing Corp., 330 W. 42nd st., N. Y. City. $7.50.

This is an A.C.S. monograph. It is therefore, not really necessary to review this book in great detail. The outstanding official position of this series largely limits the reviewer's duty to mention of its publication.

Air Conditioning, Fundamental Principles, Practical Installations and Ozone Facts, by E. W. Riesbeck. 352 pages. The Goodheart-Willcox Co., Chicago. $3.50.

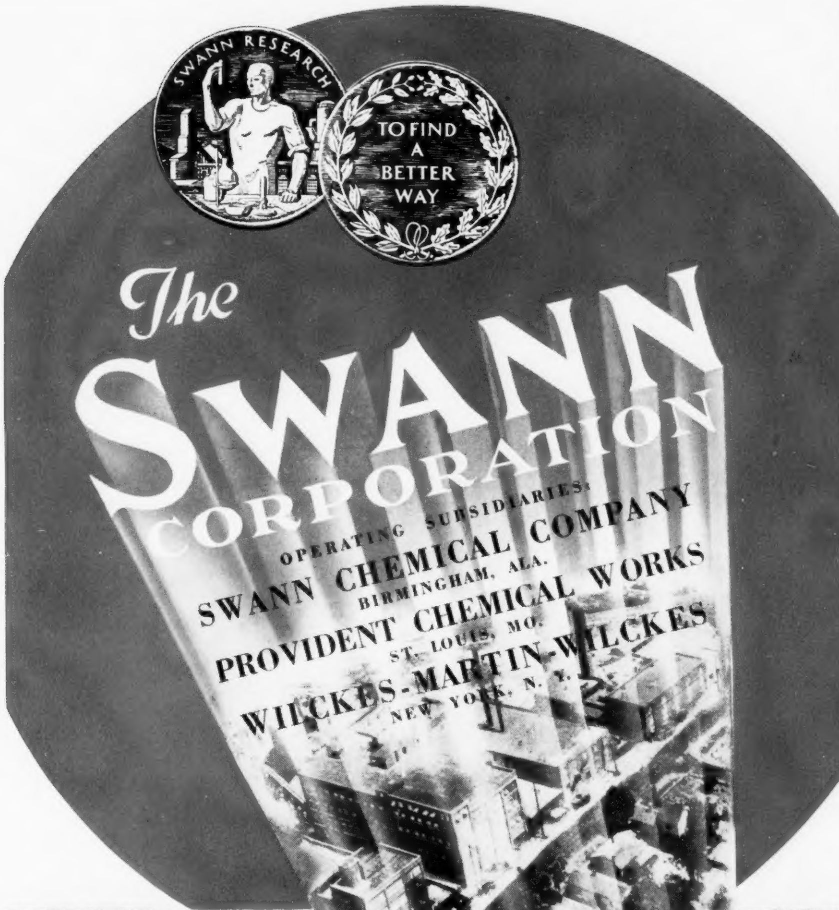
A practical handbook, written in non-technical language.

Experiments in Organic Chemistry, by Louis Fieser, 369 pages. D. C. Heath & Co., 180 Varick st., N. Y. City. $2.40.

A very splendid book for college students which was written with the definite purpose in mind of making the student more self-reliant. Material is provided for the extra bright student. The book incorporates effectively many of the newer ideas in teaching that will appeal to the more progressive and up-to-date members of instructing staffs in our colleges and universities.

Corrosion-Causes and Prevention, An Engineering Problem, by Frank N. Speller, 694 pages. McGraw-Hill Book Co., 330 West 42 st., N. Y. City. $7.

The 2nd edition of this recognized outstanding contribution to the knowledge of the basic facts about corrosion contains a wealth of new material that has been brought to light since 1926. In addition, practically all of the chapters have been completely revised and rewritten. The data on protective coatings deserves special commendation.



WE are pleased to announce the merger of The Swann Corporation into Monsanto. The merged company, through its operating subsidiaries, has for many years been a leading producer of Phosphoric Acid and Phosphates. The operating companies will now function as subsidiaries of Monsanto.

We welcome this opportunity to enlarge our services to both old and new friends in consuming industries.

Monsanto Chemical Company
ST. LOUIS, U.S.A.

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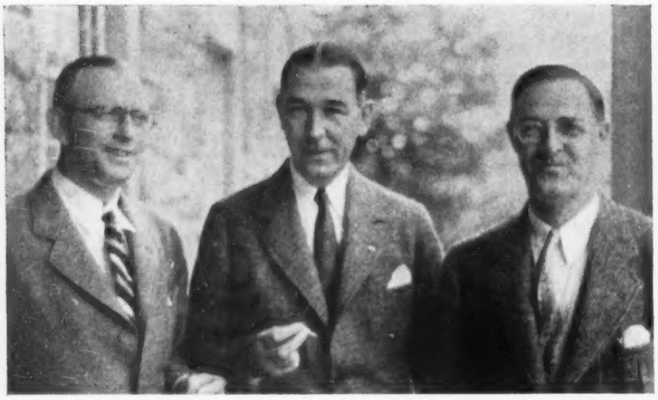
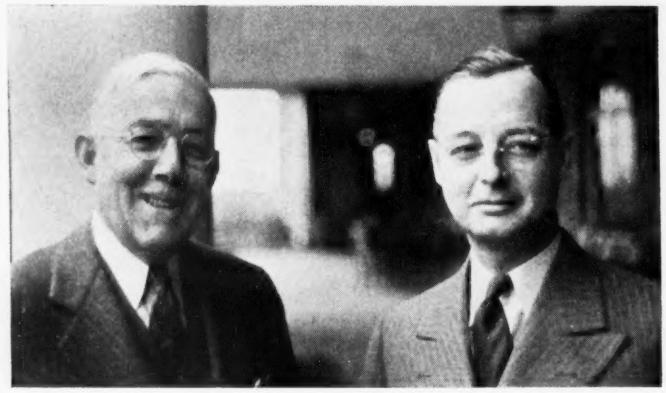
CHEMICAL

The Photographic Record





The "Candid Camera" swings into action at the joint meeting of the Manufacturing Chemists' Association and The Synthetic Organic Chemical Manufacturers' Association, at Skytop. Above, left to right, Reginald Richard (Swann); W. I. Galliher (Columbia); and John A. Kienle (Mathieson). Extreme right, Dr. Ralph E. Dorland (Dow); and Russell Curtis.

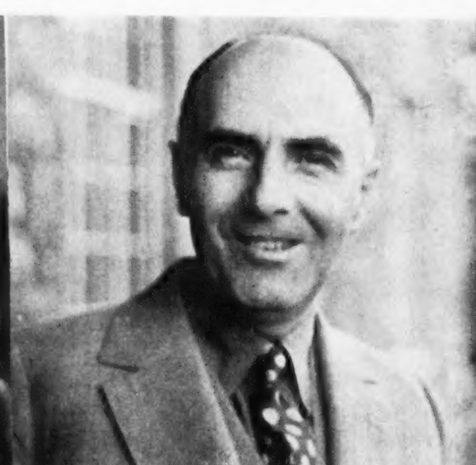
Benjamin S. Mechling (Mechling Bros.).

Stanley Weil (Natural Products Refinery).

Dr. C. M. A. Stine (du Pont).

Edgar M. Queeny (Monsanto).

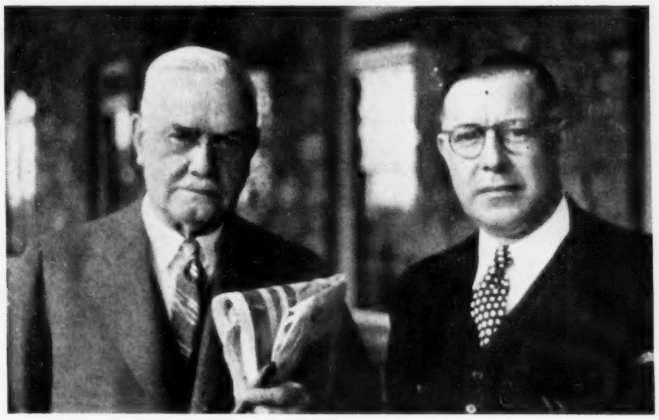
Harry L. Derby (American Cyanamid Chemical).



Dr. F. G. Zinsser (Zinsser & Co., Inc.).

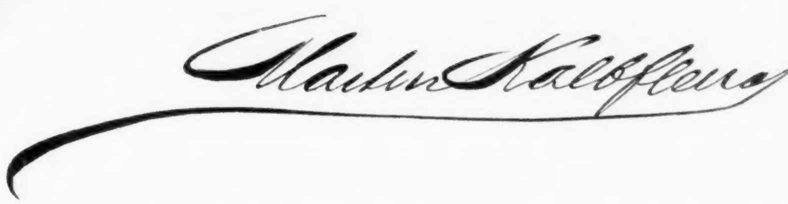
NEWS REEL

of Our Chemical Activities



Above, left to right, William A. Harshaw (Harshaw Chemical), and Albert A. Teeter (Charles Pfizer & Co.). Upper right-hand corner, left to right, M. J. Hartung (Maywood Chemical); A. A. Wasserscheid (Mallinckrodt); Victor E. Williams (Monsanto); and Dr. F. M. Russe (Mallinckrodt). In the lower group, reading from left to right, H. R. Wemple (Texas Gulf Sulphur); Waldo C. Hovey (Niacet); Milton Kutz (R. & H. Chemicals Dept., du Pont); and E. Davis (Detroit Chemical). Second row, left to right, Eli Winkler (Columbia); Cesare Protto (du Pont); G. Lee Camp (Monsanto); and Dean Clark (Chemical Alliance). Bottom row, left to right, Dr. August Merz (Calco); Charles K. Weston (du Pont); K. L. Schaubacher (Victor Chemical); and H. R. Huston (American Cyanamid).

"The Honest Dutchman" and His Youngest Son

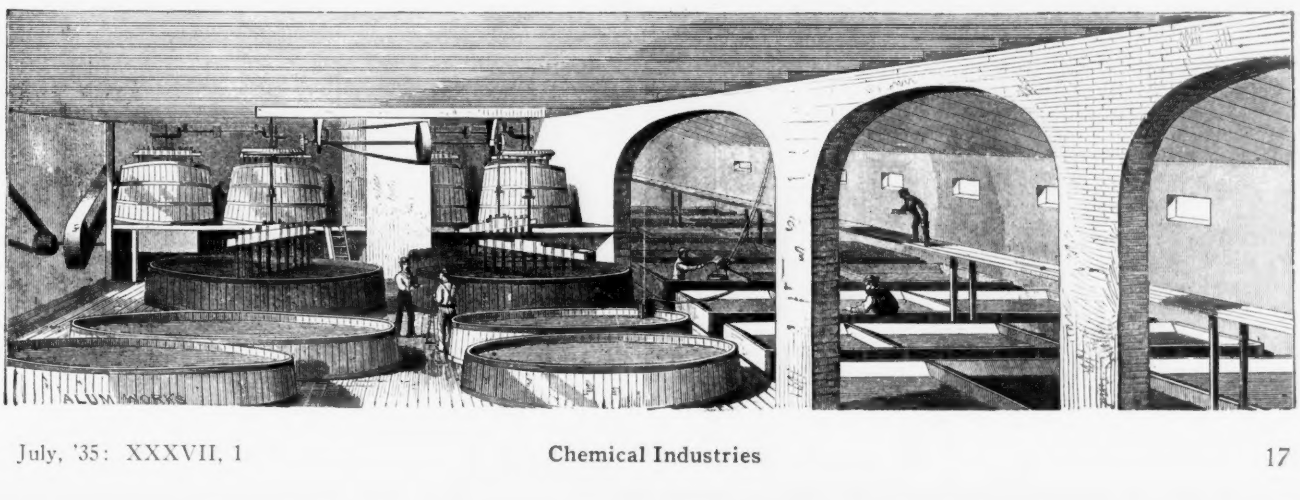


STRONG family tradition, vigorously impressed upon growing youth, must in later years either become the ruling principle of life or else be broken with completely. Such potent influences brook no compromise, and in all the annals of the American chemical industry the force of a virile chemical manufacturing tradition is never more tellingly exemplified than in the family of Martin Kalbfleisch.

The Kalbfleisch home was in the most literal sense an adjunct of the Kalbfleisch chemical works. While yet in school, the Kalbfleisch boys alternately shared plant inspection rounds at midnight and at two in the morning and reported to their father at seven o'clock breakfast the reading of half a dozen important gauges and meters. Their regular studies were supplemented by chemistry lessons administered unsparingly by a humorless Scotch foreman who before entering the Kalbfleisch employ had been a professor of the science at Edinburgh University.

Yet tradition does not portray the founder of the family as a dour parental martinet. Stern in his ideals of duty Martin Kalbfleisch undoubtedly was, and it was certainly his life-long habit to tend whatever business he had in hand with absorbing concentration; but he was by nature a rather jolly, distinctly neighborly man. Very strict, yet very kindly, he was himself the product of his own upbringing, a younger son of a substantial burgher family of Flushing, Netherlands, in whom were early ingrained the traditional virtues of the good Hollander, industry, thrift, and scrupulous honesty.

Martin Kalbfleisch was born in Flushing on February 8th, 1804; but, save that he received an exceptionally good preliminary training in the private schools of his native town, nothing is known of his boyhood. The first event in his life that he himself considered worthy of record was the important decision to seek his fortune in the Dutch East Indies.



Accordingly at the age of eighteen he took passage for Sumatra in the stout, three-masted windjammer "Ellen Douglass" whose home port was Salem, Mass., and whose shrewd New England captain was destined by Fate to turn his ambitious, but frankly opportunist plans from the Dutch colonies to the United States.

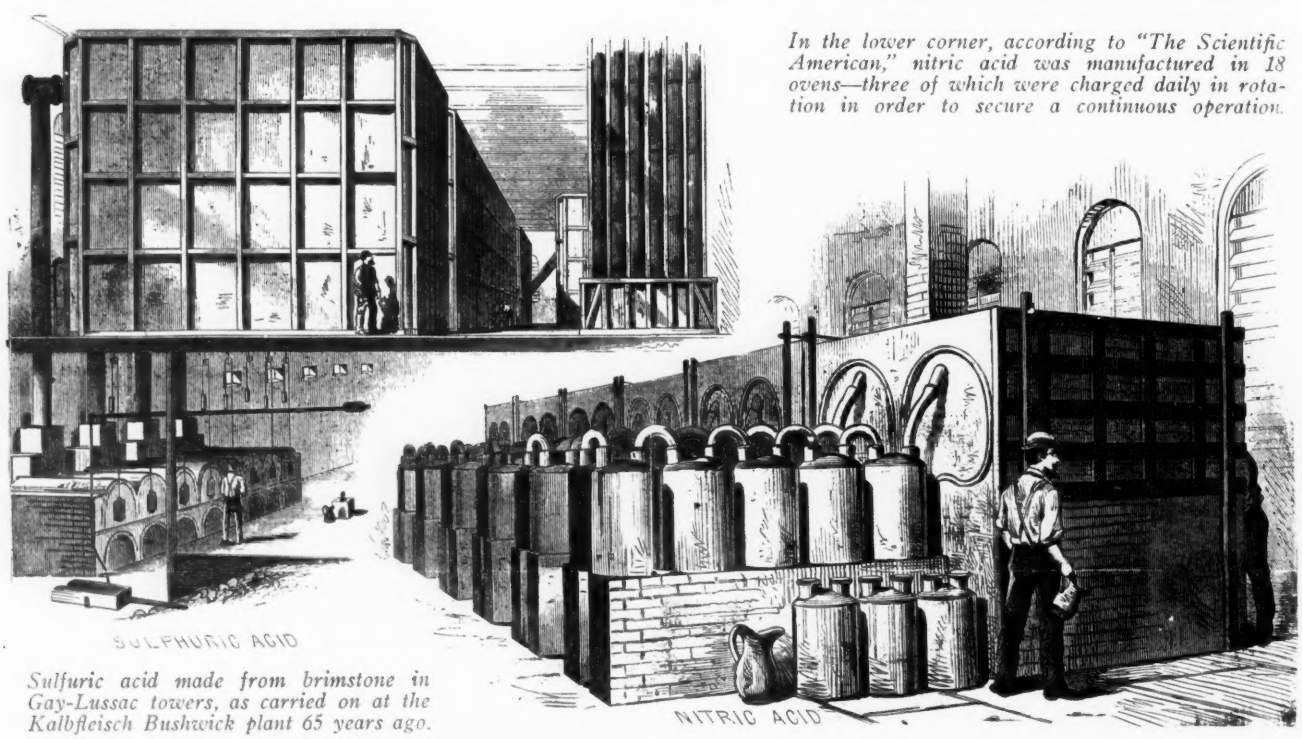
Late in 1822 the "Ellen Douglass" had scarcely dropped anchor in the mountain-rimmed harbor of Padang when she hastily put about and scudded out again into the South Seas. A plague of Asiatic cholera was raging fearfully all along the Sumatra coast, and though the adventurous Yankee trader plied among other islands, putting in to bargain calico and tenpenny nails for copra and pearls, nevertheless young Kalbfleisch resisted the blandishments of the Orient and returned with her to Europe. It is likely that already he had determined to settle in America. When the "Ellen Douglass" returned to Antwerp she was promptly sold, and her Yankee skipper took the young Hollander into a trading partnership with him. Off they posted by stagecoach to Paris, and here Martin Kalbfleisch lived during the next four years.

Although this commercial venture did not turn out well, nevertheless his stay in Paris had important results. While there his interest was directed towards chemistry, and to his determination to seek his fortune in America was added the definite objective of becoming a manufacturer of chemicals. To this end he attended the chemical lectures at the Sorbonne, then the foremost school of chemistry in the world. While studying there he met a young English girl, Elizabeth Harvey of Southampton whom he promptly married; and as he said later, thoroughly disproved the old proverb about marrying in haste, for he never regretted it afterwards. A year later, after the birth of their first child, he came to America.

In 1826 the opportunities for a young chemist, however well trained and ambitious he might be, did not appear on the surface to be particularly brilliant in the United States. Timber and turpentine, cotton and corn, cattle and fish, land and minerals—almost anything—seemed to promise greater rewards than chemicals. Beside the golden opportunities that agriculture and commerce dangled in front of any energetic youth, the prospects in industry appeared uninteresting and uncertain. Only a very discerning young man could foresee the tremendous expansion about to burst forth in all sorts of manufacturing activity: a prophetic vision was necessary to anticipate the future demand for all sorts of chemicals.

At that time the meager supplies of chemicals needed by our truly infant industries were practically all shipped from England. Although it seemed most likely that it would be a long, long time before a domestic industrial market would develop that could support a production in the United States of any but the most costly and difficultly transported chemicals, yet already a few pioneers were laying the foundations of our chemical industry. In Philadelphia, then the unqualified center of chemical activity, Harrison and Lennig were making sulfuric acid; Wetherill was producing paint pigments; Farr & Kunzi were manufacturing fine chemicals. Just about the time that young Kalbfleisch reached New York another young Hollander, George Rosengarten, was straightening out the tangled finances of a couple of young Swiss chemists, Zeitler and Seitler, who in 1822 had begun to manufacture mercurials and other medicinal chemicals.

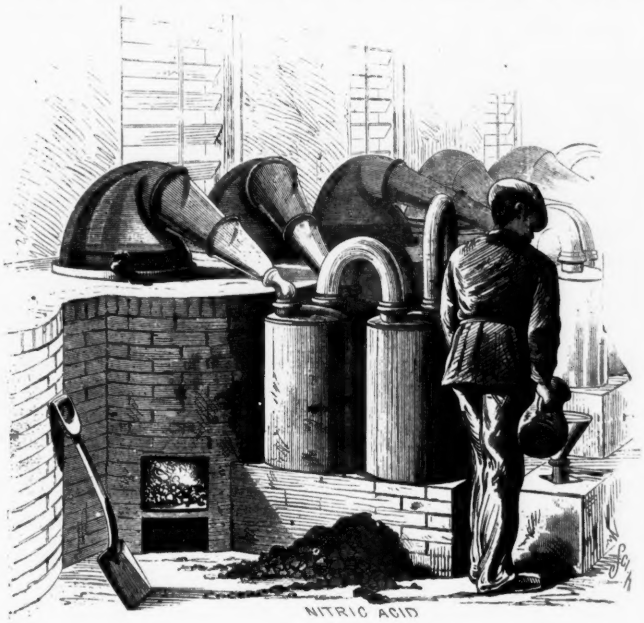
In New York a group of merchants, headed by John C. Morrison, James Jenkins, Geradus Post, and Charles G. Haynes, had recently organized a stock company to manufacture sulfuric acid, blue vitriol, lead acetate, and

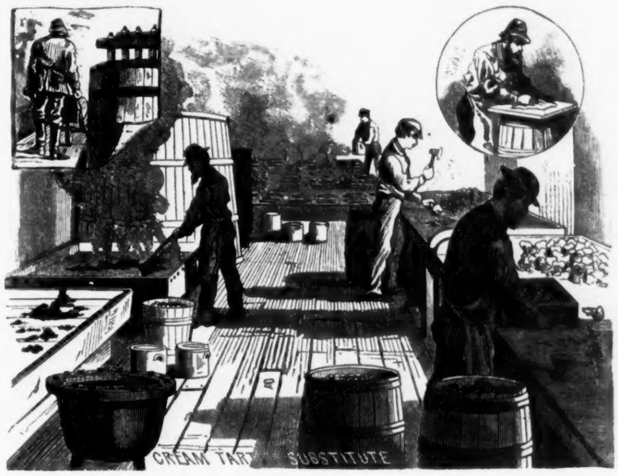


In the lower corner, according to "The Scientific American," nitric acid was manufactured in 18 ovens—three of which were charged daily in rotation in order to secure a continuous operation.

Sulfuric acid made from brimstone in Gay-Lussac towers, as carried on at the Kalbfleisch Bushwick plant 65 years ago.

The Martin Kalbfleisch's Sons Works operations as illustrated in an article in "The Scientific American," November 20, 1880.





other chemicals. They had met with initial success and were planning to expand their plant, adding to their list of products. They were handicapped, however, by the lack of a practical manufacturing man to put in charge of their operations. The post of superintendent was filled part-time by Mr. Morrison; but he was a busy wholesale druggist, and furthermore, he was not experienced in large-scale chemical making. To these backers of the New York Chemical Manufacturing Company, the arrival in New York of a young chemist fresh from the Sorbonne was most opportune. They promptly offered Martin Kalbfleisch the position of assistant superintendent.

He quite as promptly accepted their offer. It proved to be a happy combination. The position was indeed a fortunate find for a young foreigner without friends or funds. It put him in close touch with a group of influential citizens, and more than that, it gave him the opportunity to check his theoretical knowledge by the tests of actual plant-scale experience. He worked hard, demonstrated his capabilities, and within a year was put in charge of the enterprise. Under his management the plant was moved to larger quarters way out in the country (now Thirty-second Street, New York City), the output of the original products was greatly increased, and the number of items manufactured more than doubled.

For three years young Kalbfleisch managed the New York Chemical Manufacturing Company. However, he had no intention of remaining the operating man for a group of outside stockholders, so he saved his earnings scrupulously, and in 1829 stepped out as a chemical manufacturer in his own right. It is interesting to note that a few years later the merchants who had backed the New York Chemical Manufacturing Company, turned from chemical making to finance and the corporation became the New York Chemical Bank.

He bought some cheap land up in Harlem, near where he lived; built a tiny wooden plant; and engaged in the production of paint pigments. For six years this business steadily, but slowly, grew, until in 1835 when he was tempted by the boom prices being paid for Manhattan Island real estate to sell both his home and his factory and move out to Bridgeport, Connecticut.

Because this change in location carried him too far from his market, it proved to be extremely disadvantageous; but it had one distinct advantage. It started Martin Kalbfleisch upon the manufacture of sulfuric acid, a product that was eventually to become a specialty of his and one that naturally led him into the manufacture of the various sulfates and later on into the production of the other mineral acids and their salts.

While in Harlem his sense of professional ethics had restrained him from entering into direct competition with his former employers. Out in Connecticut he felt that he had entered a new territory and was accordingly justified in manufacturing the same general line of heavy chemicals. During the five years that he struggled against the geographic handicaps of this location, he installed the apparatus and worked out the processes for the production of these chemicals. In 1840 he moved back into the Metropolitan area, establishing himself in a new and larger plant at Greenpoint, Brooklyn.

Franklin H. Kalbfleisch

The first tenet in Martin Kalbfleisch's chemical creed was that sulfuric acid is the cornerstone of chemical operations. Believing this, he early determined to make the purest, strongest sulfuric acid that might be produced, and he resolved to start only with pure brimstone as a raw material. For many years he endlessly studied the reactions, the equipment, and the controls of this basic chemical process. The result was naturally that Kalbfleisch sulfuric acid soon established a reputation for itself which the company jealously guards to this day.

This deep concern with the strength and purity of his products manifested itself anew as each new item was added to the growing list of Kalbfleisch chemicals. In a short time, therefore, it came to be very well understood throughout the trade that the Kalbfleisch trademark, "Quality First," was not an advertising slogan, but a declaration of business principle.

In 1850 the chemical works of Martin Kalbfleisch moved for the third and last time into what was then the most modern and largest chemical plant in America, between Metropolitan and Grand Avenues, in the town of Bushwick, Long Island. By this time he was making sulfuric, muriatic and acetic acids, ammonia, alum, and the various salts of iron, copper, zinc, tin, and nickel. To supply his own great needs for apparatus, he had also established a pottery works, and he had also financially backed the Brookfield Glass Company. His outside business interests expanded with the growth of his chemical enterprises, and he was soon called to serve upon the directorate of a trust company, a bank, and an insurance company.

When he first moved to Greenpoint, he was distressed to find no suitable school for his large family. Characteristically he went to work, organized his neighbors, formed a new school district, rented and repaired an old building, and engaged a competent schoolmaster. Still dissatisfied, he went forward to secure for the district a new, specially built school building.

This interest in public education made an easy introduction into local politics, and he was three times called upon to serve as Supervisor of Bushwick, and later, when that town and Williamsburg were to be joined with Brooklyn, he was one of the commissioners who drew up the charter of consolidation. For six years he was a member of the Brooklyn Board of Aldermen and during half that time served as President. On May 6, 1861, he took office as Mayor of Brooklyn, and on the expiration of this term in 1863, he was sent to Congress, being re-elected to his post in the House of Representatives until 1868 when he once more became Mayor for four consecutive terms. Having in all served as Mayor of Brooklyn for a longer time than any other man, he was nominated by the Republican Party for the Governorship of New York State, but this he refused.

Martin Kalbfleisch left a bold and distinguished impression upon the civic development of Long Island. The time of his greatest political activity was not only a period when corruption was grasping to get its first hold upon municipal affairs; but also when the nation was in the throes of the Civil War. His personal integrity—his forthright honesty won him the nickname of "the Honest Dutchman"—served the cause of honest government long and faithfully; and his high courage was more than once put to the severest test. On one occasion he stood up before an angry, armed mob of draft rioters who had overridden the police, and in plain words called them traitorous cowards, ordering them to disperse. One of the mob's leaders rushed at him. Leaning over, Mayor Kalbfleisch dragged him up on the steps beside him. Silencing the crowd with a gesture, he invited the rioter to tell his story. "Then afterward," he thundered at the mob, "I will tell you your duty as citizens of the Republic!" Ashamed, the draft evader slunk away and his followers quietly scattered.

His refusal of the nomination for Governor was prompted chiefly by his own failing health. For fifty years he had driven himself unsparingly, first in the building up of his chemical business and second in wholehearted public service. In 1869, the firm which for forty years had been known only by his own name became Martin Kalbfleisch & Sons. He retired and the active management devolved upon the three sons who had been associated with him, Albert M., Charles H., and Franklin H. However, he never enjoyed the rest he so richly deserved, for he was an invalid until his death, four years later, in 1873.

The youngest son, Franklin H. Kalbfleisch, born in Bushwick in 1846, had from an early age shown an

aptitude for the chemical business and indicated clearly his sense of responsibility to those chemical interests. Educated at the Henry Street Grammar School in New York City and at a boarding school in Warwick, N. Y., he had voluntarily given up college and at the first signs of his father's illness had gone to work in the chemical plant at Bushwick. He started in at the very bottom of the operating units, conscientiously working his way through all the different departments, learning all the products and processes at first hand, and ending in the laboratories. Here he imposed upon himself a stiff course in theoretical chemistry and discovered for himself the value and the meaning of research. Accordingly, when his father was forced to give up his active control, he was well equipped to take over command. The four additional years of Martin Kalbfleisch's invalidism furnished good experience in administration with the opportunity to confer with the man who had founded and built up the business.

With this training and his family tradition behind him, Franklin H. Kalbfleisch had still to prove his own capabilities as a chemical industrialist. He had inherited his father's courage and integrity; but in a number of important respects they were very different personalities. The elder Kalbfleisch, though a strict disciplinarian, was by nature a rare politician, in the finest meaning of that now debased word. Frank Kalbfleisch was a bold and domineering leader, an industrial warrior who thoroughly relished the business battle. He was indeed a rugged individualist, with no more use for trusts and mergers than he had for trade unions. Scrupulously honest in all his dealings, he was without patience with the workman who shirked or the customer who made an unreasonable claim. The former, be he a "hunky" at the wheelbarrow or a crack salesman, he would discharge on the spot. The latter he would simply refuse to sell again.

His concentrated, uncompromising singleness of purpose was shown during the World War when to the despair of his salesmen, he virtually turned his five great chemical plants into factories for the United States Army. When regular customers came clamoring for necessary chemical supplies, he would ask if they did not know the country was at war. In the same vein, he was quixotic in his devotion to a faithful employee or a trusted business friend. Upon his death his family discovered that he was supporting more than a dozen families of ex-Kalbfleisch workmen "even unto the third and fourth generation," and his business associates were often astonished at the liberal terms or special services which he was accustomed to render old customers for what he called "past services rendered the house of Kalbfleisch."

Naturally so doughty a champion broke many a lance in competitive lists. During the Gay Nineties chemical selling was a merry war in which Frank Kalbfleisch neither asked nor gave quarter. The formation of the General Chemical Company reduced the old meleé of competition to more or less of a three-cornered fight between this merger and Grasselli and Kalbfleisch, which concentrated rather than mitigated the ancient habit of warfare.

When, as a young man of twenty-seven, Franklin H. Kalbfleisch succeeded to the post and responsibilities of his father, he plunged into his new duties with an enthusiasm that kept him working about fourteen hours a day. His business responsibilites were not a little complicated by his duties as executive of a large estate of varied interests, and the not unexpected result was that in 1880 he suffered a nervous breakdown. Upon the advice of his physician he sold his New York home, 14 East 55th Street, and moved over to Columbia Heights, Brooklyn. Here it was thought that he would benefit by the better air and, by being between the plant at Bushwick and the offices in Manhattan, would save himself some wear and tear of travelling back and forth. Within two weeks after moving to his new house, two of his children were stricken with diphtheria and died. The shock of this blow to his warm affections broke him up completely, and he was forced to give up active affairs. He promptly sold the ill-omened house on Columbia Heights, and with his wife and other children went South and later to Europe. For five years he was forced to remain away from business.

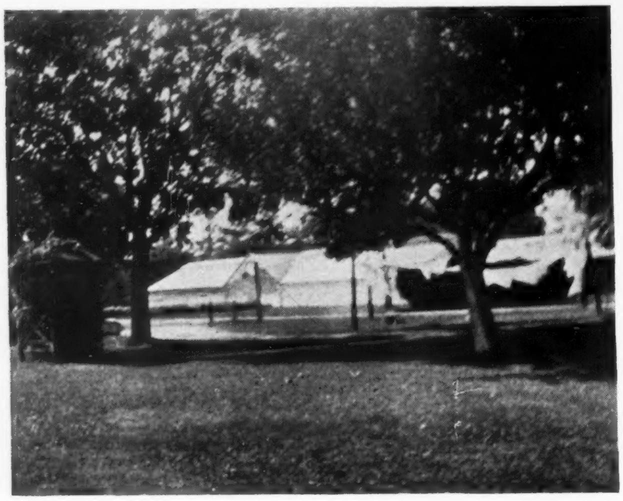
Then it was he vindicated the family tradition and proved himself a worthy successor of his sire. A man over forty, he opened an office at 19 Liberty Street as a sales agent for chemicals. Within five years he was operating two chemical plants. Only a man of indomitable will and courage to do and to fight for the principles he believed to be right, could have accomplished this rare feat of recovery. Under his leadership the Kalbfleisch business prospered. A program of expansion was successfully executed. By purchase the Erie Chemical Works, the Anatron Chemical Company, and the two plants of Joseph Binns were added as manufacturing units. Steadily and continuously the enterprise grew.

Always the ideal of Martin Kalbfleisch, "Quality First," was the guiding principle. Ceaseless research improved old processes and added new products. Aggressive selling carried the Company into wider and wider fields of service to all sorts of new industries. The World War came as a fitting climax to the long career of Franklin Kalbfleisch, devoted with his notable singleness of purpose to developing one of the great heavy chemical industries of the country.

With wholehearted patriotism he turned these important facilities over to munitions making. Of all their notable war contributions he was perhaps proudest of the work done in gas defense. At the Erie plant sodium manganate was produced for their own use as a purifying reagent in the production of alum, and learning that a British commission had come over seeking a powerful oxidizing agent to use as a gas antidote in masks, the idea was conceived of carrying this operation a step further and producing sodium permanganate. A practical method for the large-scale production of this chem-

ical was devised, and large quantities were furnished to the Government right up to the Armistice.

Amid the hurly-burly of the war activities, he providently brought into the business a younger executive destined to become his successor. He foresaw that the restoration of peace would mean a radical reconstruction of the entire American chemical industry, and he was wise and sincere enough to recognize that the intensive war production was overworking his plant equipment and straining his own physique. Accordingly, after a careful search and very thorough investigation he made a perfectly typical proposal to Harry L. Derby.



The lawn showing in the distance the greenhouses on the Kalbfleisch estate at Babylon, Long Island, N. Y.

"Young man," he said, "I want you to join this organization. You will do whatever it is necessary to do. I don't know what you are worth, so you must set your own salary. If you overvalue yourself, I shall find it out very quickly. If you under-value yourself, I shall think just that much less of you."

Upon these extraordinary terms a bargain was quickly struck which time proved to be a remarkably equitable and mutually advantageous arrangement. For in 1920 the old leader stepped aside for the new. Upon younger, more energetic shoulders were placed the heavy burdens of reconstruction and reorganization.

Mr. and Mrs. Franklin H. Kalbfleisch.

Mr. Kalbfleisch retired to his beautiful estate at Babylon, a home that he had purchased many years before and where he had lived most happily with his wife, Sarah Pirnie Schenck of New York whom he had married in 1867, and with his two daughters. This home was the sole alternative to his keen interest in business. Here his very simple tastes were fully gratified. He had the happy faculty of complete relaxation, and once away from business he found an absorbing interest in his herd of Jerseys, his greenhouses where he grew hot-house grapes and prize roses, and in later years motoring along the quiet back roads of Long Island. Once he made up his mind to retire, he did so completely; and though he continued to receive daily reports he never interfered with his successor, never made a direct criticism, never offered unsought advice. He marvelled at the vastly expanded chemical horizon of the post-war period, and rejoiced at the growth which his old company made.

Franklin H. Kalbfleisch's home at Babylon, Long Island, N. Y., where he lived many years, and to which he retired in 1920.

The Vegetable Oils

as Chemical Raw Materials—Part I

EIGHTEEN different fatty oils of vegetable origin enter into world trade in substantial quantities. They come from every section of the globe, from the South Sea Islands and Russia, from Spain and China, from the Argentine and the United States. They are secured from seeds, nuts, even from berries and roots. They are products of both annual and perennial plants of such different botanical groups as grains and legumes, palm and fruit trees. Some are grown as great commercial crops. Others are by-products. A few are recovered wastes. In commerce a number of the vegetable oils, having interchangeable industrial uses, are in direct competition, while in important fields of consumption some of these materials, because of certain chemical or physical characteristics, enjoy virtual monopolies.

Plainly the vegetable oil markets are complicated. In the interest of clarity therefore, let us at the very outset make some definitions and set up some classifications that will enable us to simplify those markets into groups.

Fatty oils and the fats, which are oils whose melting point is above ordinary temperature and hence exist normally in the solid state, are of three types, according to origin—vegetable, animal, and fish. In turn, the vegetable oils may be divided into four groups depending upon their botanical source.

1. Oils which are the principal products of annual plants, such as soybean, linseed, sesame, perilla, and rapeseed oils.
2. Oils produced as by-products of annual plants, such as cottonseed and corn oils, and in this country, peanut oil.
3. Oils which are the principal products of perennial plants, such as coconut, palm, palm-kernel, and tung oils.
4. Oils which are by-products of perennial plants, such as almond, apricot-kernel, grapeseed, and raisin oils.

Our supplies of vegetable oils, based upon their geographical source, are domestic and imported. Some of the foreign oils we import, while the raw material of others is brought in and processed in this country. Some oils we both import and produce domestically.

The principal vegetable oils produced in this country are cottonseed, corn, and peanut. Oils imported include coconut, palm-kernel, palm, rapeseed, perilla, chinawood, castor and sesame. Linseed oil is the outstanding example of an oil pressed from raw material both grown in the United States and imported. Coconut is imported and also processed in this country from imported raw material. Soybean is an oil which we both import and produce. Chinawood oil is still largely brought in from foreign sources, but we are building up both a domestic supply of raw material and a processing industry for the production of the oil.

Compared with cotton, rubber, camphor, copper, petroleum, and other well publicized industrial raw materials the vegetable oils are practically unknown to the layman. Nevertheless they are essential raw materials in the soap, margarine, linoleum, oil-cloth, printing ink, tin plate, and paint, varnish, enamel and lacquer industries, and in the manufacture of lard compounds (really lard substitutes), sulfonated oils, lubricants, and rubber substitutes. They are employed in the largest quantities of all uses as foodstuffs. And what is of even greater interest in a period of intense nationalism, we are importing, despite our pre-eminent position in cottonseed and lard, approximately one billion pounds of oils and fats in excess of our exports.

German chemists were able to solve in the test tube the problem of the Allied blockade on nitrate and camphor. The deficiency of oils and fats they could not overcome by chemical synthesis. While our position is far from analogous to that of Germany, for in an extremity we could muster sufficient supplies of fatty oils, nevertheless, dependence for these oils upon foreign supplies is a plain fact but little understood by the American public. And yet, firm in the belief that "cleanliness is next to godliness," we continue to raise our per capita consumption of soap at an amazing rate—we now use 100 cakes per year per person as against five in the Soviet Republics—and backed by one of the most intensive advertising campaigns of any American industry, that rate is accelerating tremendously.

The increased consumption of fatty oils in all groups has been remarkable. Comparative figures for 1914

and 1929, for example, excluding lard, show an increase in all uses of the oils of the food and soap group from about 2,350,000,000 pounds in 1914 to 4,025,000,000 pounds in 1929, a gain of 71 per cent. In the same period the population increased but 25 per cent. Again, excluding lard, foreign oils represented 10 per cent. of the total consumption in 1914, whereas by 1929 imports had risen to 30 per cent. of the total. Nor did the consumption of oils decline as sharply in the depression years from 1930 to 1935 as did most other commodities. In 1934 total factory consumption excluding lard ran over four billion pounds.

Oil Prices In the Depression

The price index of the Bureau of Raw Materials for American Vegetable Oils and Fats Industries for the year 1929 was 127.1; by 1932 it had declined to 61.7, a loss of approximately 52 per cent.; while by the Spring of 1935 the index stood at 114.5, a recovery of approximately 96 per cent. Compare this with a decline of only 20 per cent. and a recovery of only 10 per cent. in the chemical price index of the U. S. Bureau of Labor for the same periods and the fluctuations in the oils markets during the depression of the early thirties becomes a conspicuous example of the comparative price stabilities of natural and manufactured goods.

Playing dramatic parts on the oils and fats stage during the world-wide depression were depreciated currencies the world over and the flight from gold, first by Japan and England and later by the United States; a revival of old bimetalism doctrines which played ducks and drakes with currency exchange rates in the important oil-producing countries which are on a silver basis; the rise of nationalism resulting in legislation in many key consuming countries that have gravely affected international trade relationships; crop control and hog slaughter; deflation of oil prices; a reduction in consumption; gambling and hedging in oil futures; processing and other new, increased taxes, all bringing unnatural influences to bear upon a number of profound technical changes that had their inception about the time of the World War, and which of themselves were slowly revolutionizing the oils and fats industry.

Obviously supply and price of those oils that are by-products are dependent upon the condition in the market for the principal product. Thus, cottonseed oil economics are directly affected by the acreage and the price of cotton, by the exports of cotton, by the market for cottonseed meal and cake, as well as by the competition of lard with hydrogenated cottonseed oil products.

Interchangeability a Complicated Question

Furthermore, the interchangeability of various fatty oils in important industrial uses is often a complicating factor. While it is true that such direct competition exists between different oils, often between not only

Vegetable Oils and Whale Oil: Leading Sources of the Oils and of Their Raw Materials, and Chief Countries Importing and Exporting Such Oils and Oil-Bearing Materials*

Oil	CHIEF COUNTRIES					
	Producing raw material	Exporting raw material	Importing raw material	Producing the oil	Exporting the oil	Importing the oil
Cottonseed	United States, India, Egypt.	India, Egypt	United Kingdom ...	United States, United Kingdom, Fgypt.	United States, United Kingdom, Egypt.	Canada, Germany, Netherlands.
Peanut	India, Africa, China	India, Africa	France, Germany ..	France, Germany, China	France, Germany, China.	United Kingdom, Netherlands.
Olive	Spain, Italy, Greece, Portugal, No. Africa.	....	....	Spain, Italy, Greece, Portugal, No. Africa.	Spain, Italy	United States, France, United Kingdom.
Coconut	Philippine Islands, Netherland East Indies, Ceylon, British Malaya, India, So. Pacific Islands.	Philippine Islands, Netherland East Indies, Ceylon, British Malaya, So. Pacific Islands.	United States, Netherlands, Germany, France.	Philippine Islands, Netherland East Indies, Ceylon, India, United States, Netherlands, Germany, France.	Philippine Islands, Ceylon, Netherlands.	United States, United Kingdom.
Linseed	Argentina, United States, India, U. S. S. R.,[1] Canada.	Argentina, India, Canada.	United States, United Kingdom, Netherlands, Germany.	United States, United Kingdom, Netherlands, Germany, U. S. S. R.[1]	Netherlands, United Kingdom.	United Kingdom.
Soybean	China	China	Japan, United Kingdom, Germany.	China, Japan, United Kingdom, Germany.	China, Japan, United Kingdom, Germany.	United Kingdom, Netherlands.
Sunflower	U. S. S. R.,[1] China	U. S. S. R.,[1] China	Germany, United Kingdom.	U. S. S. R.,[1] China, United Kingdom, Germany.	....	....
Rapeseed	India-China	India-China	Japan, United Kingdom, Germany, Netherlands.	Germany, India-China, Japan, United Kingdom, Netherlands.	Japan, United Kingdom.	United States.
Sesame	India-China	China	Netherlands, Germany, United Kingdom, France, United States.	India-China, Netherlands, Germany, United Kingdom, France, United States.	Netherlands	United States.
Palm-kernel ...	Africa, Netherland East Indies.	Africa, Netherland East Indies.	Germany, United Kingdom.	Germany, United Kingdom.	Germany, United Kingdom.	United States.
Palm	Africa, Netherland East Indies.	....	....	Africa, Netherland East Indies.	Africa, Netherland East Indies.	United States, United Kingdom.
Hempseed	U. S. S. R.[1]	....	....	U. S. S. R.[1]	....	....
Tung	China	....	....	China	China	United States.
Perilla	China	China	Japan	China, Japan	China, Japan	United States.
Whale	Antarctic waters ...	....	....	Norway,[2] United Kingdom.[2]	Norway, United Kingdom.	United States, Germany.
Corn	United States	....	....	United States	....	....

* Taken from Report 41, Second Series, U. S. Tariff Commission—"Report to the Congress on Certain Vegetable Oils, Whale Oil, and Copra, 1930."
[1] Union of Socialist Soviet Republics (Russia).
[2] That is, vessels registered under flags of these countries.

vegetable oils but also between oils in all three divisions, it is certainly not true that substitution can be carried on indiscriminately. Therefore, prices are all brought more or less in direct relationship, and the determining factors in the decision of the oil user, aside from the price consideration, are the amount of refining necessary to fit an oil for a given use, the character of the finished product, and in some cases the by-products that are derived. Each oil has its own very definite characteristics. Some are definitely not interchangeable; others have properties so similar that they may be quite freely substituted one for the other. A number of oils are interchangeable only in the sense that any substitution involves a serious change in the method of use or in the character of the finished product.

Several technical factors enter into any consideration

	Iodine Number*	Saponification Numbers†
Linseed Oil	173-201	192-195
Tung Oil	170.6	....
Menhaden Oil	139-173	190.6
Soybean Oil	137-143	193
Sunflower Oil	119-135	....
Corn Oil	111-130	188-193
Cottonseed Oil	108-110	193-195
Sesame Oil	103-108	....
Rapeseed Oil	94-102	170-179
Peanut Oil	83-100	190-196
Olive Oil	79-88	185-196
Lard	46-70	195.4
Palm Oil	51.5-57	196-205
Beef Tallow	38-46	193.2-200
Mutton Tallow	35-46	192-195.5
Palm Kernel Oil	13-17	242-250
Coconut Oil	8-10	246-260

* From S. Lewkowitsch, *Chemical Technology and Analyses of Oils, Fats, and Waxes*, pp. 419 24. † Same source, pp. 395-400. Data assembled by Alsberg & Taylor, *The Fats and Oils—A General View*, p. 15 and p. 18.

of interchangeability. These are briefly: 1,—The melting points; 2,—Chemical "saturation"; 3,—Saponification value; 4,—Color, odor, and taste; 5,—Free fatty acid content; 6,—The content of moisture and unsaponifiable matter.

The melting point of an oil often sets definite limits to its possible uses. Chemical "saturation" is measured by the so-called iodine number or value, representing the amount of iodine which a given quantity of an oil will absorb and is a definite indication of how much hydrogen will readily combine with it. Accordingly, the iodine number affords a good indication of an oil's hydrogenation possibilities as well as its drying qualities. The saponification value is a measure of the amount of alkali that will be required for saponification, invaluable data for the soapmaker whose alkali costs are a major item of expense. It also indicates the yield of by-product glycerine. The limitations placed upon an oil by color, odor, and taste are quite obvious. High free fatty acid content usually forecasts quick rancidity. High moisture content and great percentage of unsaponifiables are naturally objectionable in most all uses. In addition, if the oil user is making soap, he is always interested in lathering qualities; if he is in the paint or linoleum fields, the drying properties become extremely important, or if he is in the food group, he is concerned with the sharpness of the melting point, as well as other technical indications of the basic properties of the oils he proposes to substitute for the ones with which he is readily familiar.

The refining of oils and the changes so wrought in their quality are naturally of first importance, accordingly the user, as well as the supplier, often demand information on the methods that have been employed. There are seven common treatments, briefly summarized as follows:

1. Coagulation and settling.
2. Neutralization with an alkali followed by decantation or filtering.
3. Filtering, an operation which is largely one of bleaching, usually employed only after coagulation and/or neutralization.
4. Bleaching with oxidizing or reducing agents.
5. Hydrogenation, or the process of introducing additional hydrogen atoms. This process, introduced commercially about 1910, constitutes perhaps the most outstanding technical development creating further possibilities in the substitution of oils.
6. Deodorization by passing superheated steam through the material while under vacuum.
7. Stearin separation through cooling and pressing, followed by decantation.

Finally, but certainly not of the least importance, part of the supply of certain oils is used for edible purposes and part in industry. In the case of many vegetable oils one grade is edible while other grades are not.

Cottonseed oil consumption leads all other vegetable, animal or fish oils by a very wide margin. In 1934, 1,377,437,000 pounds or over 25 per cent. of the total factory consumption of 4,028,003,000 pounds of all oils was the by-product of "King Cotton," and this, despite the Roosevelt policy of restriction of volume of cotton production. Second to cottonseed oil in consumption figures is coconut oil with a total of 589,602,000 pounds, or about a third as much.

Importance of Lard Compounds

The largest single use for cottonseed is in the manufacture of lard compounds or substitutes. In 1934 1,058,733,000 pounds (80 per cent. of the total) were employed for this purpose; 54,778,000 pounds in the manufacture of margarine; and 155,343,000 pounds in the preparation of other edible products; consumption in other lines was negligible.

The manufacture of lard substitutes began on an important scale about 1870. In the intervening years the methods and raw materials have changed considerably, but since 1920 approximately 80 to 90 per cent. of the total raw materials has been cottonseed oil. There are six methods of preparation, but the most popular are either from blends of unhydrogenated and fully hydrogenated vegetable oils, or vegetable oils hydrogenated to the desired consistency. This statement must be tempered somewhat in describing conditions in the first half of the decade beginning in 1930. The relative cheapness of the animal oils, compared with the high price for cottonseed and other vegetable

oils, prompted considerable substitution of tallow. In some cases this has run as high as 25 to 30 per cent. The question is one of the relative price, rather than one of technique or quality. Further, there is, of course, direct competition with the price of lard. In fact, the price of the lard substitute must in the last analysis be set by the price of lard. The maker of the substitute must "cut his cloth" to this measure. At times this has proven to be a difficult task. To the woes of the legitimate user of cottonseed oil have been added the speculative interests, those who usually confine their attention to the stock market.

Conditions were different when the producers of lard compound were first casting about for a suitable raw material that would at once be of high grade and cheaper than lard. Cottonseed oil was then available in large quantities. Its production was capable of still further expansion. Because of its high shortening value and the ease with which it could be processed it was ideal for their use. From then on cottonseed oil consumption declined away from the soap kettle, where it is not particularly suitable because of a tendency towards rancidity, and into the plants of the lard compound manufacturers. This had a final effect of raising the level of cottonseed oil prices above the level of soap oil prices.

Other oils can be and are used, but generally the hardened culinary oil manufacturer hesitates to change. He knows from long experience how to handle cottonseed oil, and he fears the possible reaction of his customers. Habit and a goodly supply of cottonseed oil have in the past prevented any worthwhile substitution of peanut, sesame, corn, soybean, sunflower, palm, coconut and others. All these have been used to some extent, rather as an added, cheaper ingredient or to gain some particular flavor rather than as a definite substitution for cottonseed oil.

Expanding Markets for Salad Oils

Since 1920 the cooking and salad oil industries have jumped ahead by leaps and bounds and consume 700 to 800 million pounds of vegetable oils annually. The products in this group include oils refined and prepared for general culinary purposes, mayonnaise and other dressings, and sandwich spreads. The very definite requirements of these industries make mandatory oils that are liquid at both winter and summer temperatures, with reasonable keeping qualities and of medium consistency with the ability to emulsify readily.

Traditionally, the preferred salad dressing is olive oil, but the economics of the situation work against its use by commercial producers of these items and restrict its use to a great extent to the home. Cottonseed is the principal oil used. For this purpose it must be "winterized," that is, its stearin content must be removed by pressing to prevent cloudiness in cold weather. Next in importance is corn oil followed by peanut and sesame. Corn oil is often substituted for cottonseed in the winter months because of its lower solidifying point.

Industrial Fluorine Compounds

The past decade has witnessed an appreciable expansion both in the industrial utilization of the compounds of fluorine and in the amount of scientific knowledge accumulated on the subject. So far, however, scientific research has outstripped industrial application, as is made evident by a concise review of the subject written by Dr. W. Lange, of Berlin, in the *Chemiker-Zeitung* of May 15 and abstracted in *The Chemical Trade Journal* (London).

For many years the original method devised by Moissan in 1886 for the isolation of fluorine element was not improved upon, but it is now possible to produce fluorine gas with a current efficiency of 92 to 94 per cent., and in apparatus constructed of copper or magnesium. There is, indeed, now no technical reason why fluorine gas could not be made commercially available compressed in metal cylinders. It is true that fluorine vigorously attacks metal with the production of fluorides, but the layer of fluoride first formed adequately protects the metal against further attack.

Direct Fluorination of Organic Compounds

The availability of fluorine as a commercial product should, in its turn, mean the possibility of improved methods for the direct manufacture of fluorine-substituted organic compounds. The organo-fluorine compounds are already of considerable commercial importance as refrigerating media, the two products—dichlordifluoromethane and dichlortetrafluorethane—being employed fairly extensively for this purpose in the United States. Other organo-fluorine products are, according to present research indications, likely to prove of specific value as insecticides and fungicides. The reaction between pure fluorine and a pure organic compound is, of course, too violent a one to be even thought of as an industrial proposition, but it has been found that the reaction can be effectively regulated by the dilution of the fluorine with nitrogen or carbon dioxide, and the solution of the organic compound in carbon tetrachloride or dichlordifluoromethane. The reaction thus modified has shown itself perfectly feasible with a wide range of aliphatic and aromatic compounds, both saturated and unsaturated.

Boron fluoride is a compound which has shown itself exceptionally suitable for the production of fluorinated organic compounds, but one of the most elegant methods for their preparation is that worked out by Balz and Schiemann. By the diazotization of organic compounds in the presence of hydrofluoboric acid, there is formed the difficultly soluble and absolutely non-explosive aryldiazonium borofluoride; and, on gradual heating, this last mentioned compound decomposes smoothly, giving the aryl fluoride in very good yield, and liberating nitrogen and boron trifluoride, which can be recovered and reconverted into hydrofluoboric acid, so that the process becomes a cyclic one. A large number of aryl fluorides difficult or impossible to prepare by the older known method have been produced by this new process.

These new organic compounds of fluorine are at present under intensive investigation, but it is too early as yet to forecast in exactly which fields they are likely to find major industrial application.

So far as the inorganic compounds of fluorine are concerned, one useful observation that has been made recently is that the presence of fluorides markedly enhances the tendency to crystallization possessed by fused silicates, particularly at higher temperatures.

It is worth recording that interest in the pure chemistry of fluorine really revived in 1927, when P. Lebeau and A. Damiens detected the presence of fluorine oxide (F_2O) in the fluorine gas produced by the electrolysis of a potassium bifluoride that was not quite anhydrous, and later worked out a process for the preparation of the oxide in greater yield by the slow bubbling of fluorine gas through a two per cent. solution of caustic soda. Compared with the analogous oxide of chlorine, this new fluorine compound is remarkably stable.

Lower Costs for Purchased Power

By Waldo Hutchinson

SOMETIMES it is not feasible for chemical plants to install power-generating equipment, and the purchase of power to best advantage becomes an important factor in costs. Two methods are available for securing power from the utilities at lower costs —make full use of existing rate structures or influence the utility company, or the state regulating commission, to modify these schedules to your benefit.

Most utility companies have found it is a sound policy to render the highest service to their customers, advising them as to rate changes and the respective advantages to be gained through the purchase of electricity under available contracts. These utilities will survey your plant and suggest how you can reduce power costs. Size up the quality of service you are getting and the real intentions of the utility. If its service leaves little to be desired, your possibilities of securing power at a lower cost will not be so great as in cases where the utility pays little attention to your particular problem.

How to investigate existing schedules depends first upon the experience of your own organization in such matters. While rate investigations are best carried on by an engineer with experience in the rate field, your staff may be able to care for technical matters without an outside man. Again, some executives without engineering or electrical experience have accomplished excellent results by studying the subject and acting in cooperation with the utility.

Secure a complete set of the rate schedules offered by your supplying utility and all regulations which concern the application of these rates. These schedules should be secured from your state regulating board, since some utilities do not care to give out all of their schedules. Secure, if possible, information on the decisions of the board in the different rate hearings of your utility, and the board's interpretation of the rate at schedules in the different complaint cases. In addition, obtain a working knowledge of the public utility act in your state.

With all schedules before you, classify them as follows: (a) schedules which exactly apply to your service conditions; (b) schedules which do not exactly apply to your service conditions but are possibilities; and (c) schedules eliminated from consideration because they do not apply to your conditions in any respect. Next take schedules in Class A and apply them to your operating conditions for the previous year, figuring them out in dollars and cents of total cost. Follow the same procedure with Class B, and grade each schedule according to its advantages.

If your present contract is the best you can secure no advantage by a change of contract is possible; and the problem becomes one of making full use of the conditions in the existing contract. However, if another schedule enables you to lower power cost, the problem becomes one of contract change. If the desirable schedule lies within Class A, you will have little difficulty in securing the change. If, however, your conditions do not comply exactly with the conditions of the contract you want, the problem becomes one of changing your operations to come within the requirements. If, for example, you are purchasing unrestricted service, an off-peak contract will lower current costs, providing such conditions may be applied to your operations.

There are a number of factors which affect the cost of power. The most important factors of these are as follows:

Basis of Service Charge—in small plants this may be based upon demand tests, find out when the test was made; and if your operations are curtailed, ask for a new test and a new rating. A permanently installed demand meter is often more satisfactory to both the utility and the customer. Where such an instrument is installed, you may reduce the service charge by controlling your demands wherever possible.

Lighting—in certain cases the lighting current may be metered through the power service. There are wide variations in the restrictions placed upon this type of service. Usually the use of plant lighting is limited to a percentage of the total demand, with excesses over the allowable proportion carrying an additional charge.

Since these service conditions may vary in the different contracts, selection of the most favorable schedule may reduce the total cost of lighting and power.

Service Voltage—where special rate schedules are offered to customers who purchase at high voltages, it may be advantageous to install a high-voltage substation and make use of such a contract. Such possibilities are usually open to large power customers only. However, if a discount of 5 per cent. or less is offered to those who maintain their own substations, it will seldom be of advantage to install the necessary transformers.

Restricted Service—Many forms of service limitations are found in the rates of different utilities. Off-peak service is the most common, and one not ordinarily difficult to comply with, providing the restricted periods occur in the early evening hours of the mid-winter months. If you are purchasing unrestricted service, this form of rate represents one of the best means of lowering costs.

Power Factor—most utilities have penalty provisions for low-power factor service. Rearrange your motors so that they operate at or near full load. Where such methods cannot be employed, it may be advisable to install a capacitor or a synchronous condenser.

Auxiliary Service—if you have an obsolete generating plant, disbanded because the utility offered power at lower cost, you may be able to recondition this plant and change it from a frozen asset to a profitable auxiliary. This applies particularly to wide variations in load conditions so that your own equipment can carry peak loads of seasonal or short duration. Careful planning and execution in the use of your auxiliary may reduce your power bill materially without a proportional increase in your operating costs. In fact, it may be to your advantage to install an auxiliary to take care of peak loads. If generating all of your power, you may purchase a portion of your requirements to advantage. This is especially true in a plant which has wide variations in load.

Often power companies resent the intrusion of the itinerant engineer who renders rate advice. Therefore you may get better results in negotiating with the utility if you yourself take care of the conferences. If a rate consultant carries on the negotiations, it will be a battle of data and brains, with the power company usually having the advantage of data, and taking the attitude that it will not yield a point beyond the exact conditions stipulated by some concession or stretching of the regulations.

One added word of caution concerning negotiations with the power company: you may be enjoying immunity from low-power-factor penalties only because the utility has chosen to ignore the possibilities in this direction or you may be favored with other concessions not uncommon in enforcing contracts. If this be the case, proceed carefully before seeking further concessions. While the power company may allow certain changes, they may enforce extra conditions which will erase the advantages secured through the change.

You must be in a bargaining position before you can expect much success in getting the utility to modify its schedule. While you may have the legal right to go before the regulating commission, such a move is expensive, and will be uncertain of results. On the other hand, the utility can usually add another optional schedule by the simple process of filing it at the office of the regulating commission. Obviously, the best method of securing a rate change is to work through the utility.

Manganese Ore Statistics

Expanded activity at iron and steel plants in 1934 was accompanied by an increase in shipments of domestic metallurgical manganese ore, ferruginous manganese ore, and manganiferous iron ore and of manganese ore imported for consumption. There were also increases in the domestic shipments of battery and miscellaneous ores, according to data compiled by the U. S. Bureau of Mines.

Shipments of manganese ore (35 per cent. or more manganese) from domestic mines (exclusive of Puerto Rico) were 26,514 long tons averaging about 43 per cent. manganese (natural) and valued at $571,748 in 1934 compared with 19,146 tons averaging about 45 per cent. manganese (natural) and valued at $466,285 in 1933. Shipments of manganese ore from Puerto Rico to the United States were 1,711 long tons valued at $69,000 in 1934 compared with 1,638 tons valued at $66,450 in 1933.

The total shipments of manganese ore in '34 (exclusive of Puerto Rico) consisted of 14,978 long tons of metallurgical ore (9,527 tons in 1933), 8,889 tons of battery ore (7,904 tons in 1933), and 2,647 tons of miscellaneous ore (1,715 tons in 1933).

Manganese ore was shipped from Arkansas, California, Georgia, Montana, Tennessee, and Virginia in '34. Montana (43 per cent.), Georgia (24 per cent.), and Arkansas (22 per cent.) supplied 89 per cent. of the total shipments.

Shipments of ferruginous manganese ore (10 to 35 per cent. manganese) from domestic mines were 23,231 long tons averaging about 22 per cent. manganese (natural) and valued at $108,272 in 1934 compared with 12,779 tons averaging about 26 per cent. manganese (natural) and valued at $57,837 in 1933. Ferruginous manganese ore was shipped from Alabama, Arkansas, Georgia, Montana, and Virginia in 1934. Montana (48 per cent.) and Georgia (40 per cent.) supplied 88 per cent. of the total shipments.

Shipments of manganiferous iron ore (5 to 10 per cent. manganese) from domestic mines were 198,591 long tons averaging 7.7 per cent. manganese (natural) and valued at $512,818 in 1934 compared with 178,852 tons averaging 7.8 per cent. manganese (natural) and valued at $471,367 in 1933. Manganiferous iron ore was shipped from Georgia, Michigan, Minnesota, and Wisconsin in 1934. Minnesota supplied virtually all the manganiferous iron ore shipped in 1934.

Manganese ore imported for consumption in the United States amounted to 341,339 long tons containing 165,840 tons of manganese and valued at $3,529,182 in 1934 compared with 288,187 tons containing 141,458 tons of manganese and valued at $3,003,-091 in 1933. Of the total ore imported for consumption in 1934, 36.6 per cent. was from U. S. S. R., 21.6 per cent, from the Gold Coast, 18.7 per cent. from Cuba, and 16.4 per cent. from Brazil.

Chemical Engineering Problems of Our Mineral Resources

By D. B. Keyes

Chemical Engineering Division, University of Illinois

While Dr. Keyes is dealing specially with the best utilization of the mineral resources of Illinois, nevertheless, as he points out, their solution depends very largely upon the successful application of chemical engineering, and as many of these products are industrial chemical raw materials, this paper presented at the Mineral Industries Conference at the University of Illinois, has a very definite application to the problems of chemical engineering.

UTILIZATION of the mineral resources of Illinois constitutes one of the most important fields of activity for the chemical engineer. Coal and petroleum are the two resources that seem to offer the greatest chance for industrial development.

The Chemical Engineering Division of the University of Illinois, always interested in the State's resources, has spent thousands of dollars in an attempt to lay a foundation for their greater use. It is worthwhile to review briefly not only the work that the Division has done in the last few years, but to point out specific problems which should be profitable. The subject will be treated under four headings: Coal, petroleum, stone, and silica.

Coal

Improvement of the Product: It is well known that Illinois coal when burned in furnaces for the production of power and for domestic heating is apt to show a low efficiency of combustion due to certain chemical and physical characteristics. Slag formation on boiler, economizer and preheater tubes is an example of this inefficiency. This is distinctly a chemical problem in that it has been shown that the character of the ash and the slag can be materially changed by a chemical treatment of the coal before combustion.

A thorough scientific study of the complex silicates that are formed in the slag will undoubtedly indicate what can be done to prevent the formation of undesirable material which adheres to the heating surfaces.

It should be remembered in domestic heating that, owing to the high volatility of Illinois coal, there is a tendency to lose an appreciable portion of the fuel up the stack and a marked increase in the efficiency of combustion would prevent this loss. Anything that can be done to improve the combustion characteristics of this coal will materially increase the value of the product.

One of the impurities in Illinois coal is sulfur, which is present to the extent of one to six per cent. The sulfur dioxide formed by combustion is an irritating gas that is corrosive when present in a humid atmosphere. The removal of sulfur from Illinois coal would mean much in the prevention of air pollution in the cities and towns.

Considerable time has been spent to devise some method of sulfur removal from the coal. Our experiments indicate that a combination of a coking and hydrogenation process may prove feasible. At the present time certain coals can be washed by a standard commercial process and over half of the sulfur removed, but it is highly desirable that a process be developed that can be utilized for the removal of sulfur from all coals marketed within the State. There is no question but that this is an outstanding research problem, because if most of the sulfur could be removed the value of the coal would materially increase. Furthermore, if the sulfur could be removed in a usable form and at a price such that it could compete in the present market, Illinois would have a new mineral resource in a quantity sufficient to make it a factor in the world market.

Utilization of Coal: Considerable work has been done, especially in Europe, on the hydrogenation of coal to produce oil and motor fuel. It is our opinion that coal could be first oxidized and then hydrogenated to produce a superior product, possibly solvents or intermediates for the synthesis of organic chemicals. We do not wish to give the impression that the problem could be solved satisfactorily in a short time, but undoubtedly the transformation of coal into liquid products is well worth the consideration of our mineral industries.

Beside the oxidation and reduction of coal, we should also consider the destructive chlorination of coal and coal ash to produce valuable organic chlorides and metallic chlorides, such as aluminum chloride. This is a field that has not been investigated, but is an excellent example of the possible formation of new compounds which could be used in the industry, based on a chemical treatment of coal.

Utilization of By-Products: The Division has done considerable work on the chlorination of methane — one of the principal by-products formed in the coking of coal. The chlorinated hydrocarbon has a possible use as a solvent for cleaning textiles. One commercial concern is continuing the development of this process at the present time. Further fundamental work along this line would be desirable.

Benzol and tar, formed in the coking of coal, have long been used for raw materials for the production of dyes, medical products, and a great many synthetic organic chemicals. At the present time considerable interest is being shown in utilizing these raw materials for the manufacture of anti-oxidants to be used in rubber manufacture and the stabilization of motor fuels.

Carbon monoxide, which can easily be produced by the partial combustion of coal or coke, can be made the source for the synthesis of acetic acid. Considerable time and money have been spent by the Division on the reaction between carbon monoxide and methyl alcohol to produce this product. This operation takes place under high pressure in the presence of certain catalysts. Acetic acid, in turn, is the most widely used organic acid and is one of the chief raw materials for the manufacture of artificial silk. This particular product is growing in popularity and if acetic acid could be produced at a lower cost, undoubtedly its utilization, not only for this purpose but for the manufacture of non-inflammable film, plastics, etc., would materially increase. There is probably no single organic chemical at the moment which has a more attractive future than acetic acid.

Beside acetic acid, benzaldehyde has been made in our high pressure laboratory by the action of carbon monoxide on benzol.

Carbon monoxide will react with hydrogen, produced in the coking process, to form the higher alcohols so commonly used in lacquers and for various solvent purposes.

The Division has studied the reaction between carbon dioxide, another combustion product of coal, and benzol to produce benzoic acid. The sodium salt, known as sodium benzoate, is a common product used in our food industries.

Carbon dioxide and beta-naphthol react to produce beta-hydroxy naphthoic acid, a product and a process that is now of commercial significance. This product is the intermediate in the manufacture of many of our red dyes.

The production of urea by the interaction of carbon dioxide with ammonia is now a commercial success. This product can be made at a price so that it is attractive as a fertilizer.

We have spent over $60,000 during the last six years studying the recovery of sulfur dioxide from flue gas, and the present indications are that we will be able to produce liquid sulfur dioxide at a price far below its present value. The quantity of sulfur dioxide produced by this process in Chicago will be sufficient to meet the demands of that area. We hope, also, to be able to produce this product at a price that will permit its conversion into free sulfur and sell it in competition with the sulfur produced in Louisiana, Texas, and elsewhere.

Sulfur is one of the greatest raw materials for the production of sulfuric acid, which is the chief acid used throughout the world. It has often been said that the industrial prosperity of the United States is indicated by the amount of sulfuric acid consumed. If it is possible, as we hope, to decrease the cost of this universal chemical, we will be able to create for our State a new mineral industry of huge proportions and one that will have an effect on the economic structure of the industries within the State. The importance of sulfur in agriculture should not be under-estimated.

Petroleum

Production: The available supply of oil from our producing fields is being rapidly depleted. Several chemical processes have been proposed to make available oil which cannot be profitably extracted at the moment. Most of these treatments involve the use of some acid. One of the chief difficulties of these processes is the excessive corrosion of metal equipment. Research is now being done in several organizations to produce organic inhibitors to prevent this corrosion.

Another scheme for recovery of oil that is not now available is known as "repressuring". Gas is pumped into the ground and dissolves in the oil. Before the feasibility of this process can be determined, it will be necessary to know the solubility of gases in the oil under very high pressures. Work of this kind has been done by the Division.

Utilization: Considerable interest is now being shown by our refineries in the polymerization of gases produced in the cracking process for the production of both motor fuels and lubricating oils.

The greatest organic solvent in the United States from the standpoint of production and utilization is ethyl alcohol. The present methods of production of this product are largely confined to the fermentation of agricultural products, especially black strap molasses imported from Cuba, Porto Rico, and Hawaiian Islands. One of the large chemical companies has recently built a plant at Whiting, Indiana, for the production of alcohol from waste gases purchased from the petroleum refineries. We have done considerable fundamental work on an improved method for the production of alcohol in which ethylene gas is allowed to react with water in the presence of a catalyst. It has been discovered that the equilibrium for this reaction is favorable at low temperatures. A catalyst which would operate under these conditions would solve the problem.

Acetaldehyde has been produced by a special air oxidation of petroleum and is easily recoverable. This product can be oxidized further by a commercial and standardized process to produce acetic acid, which has been mentioned above. It is thought by some that this will undoubtedly be one of the chief sources of acetic acid in this country.

Various research organizations in our refineries are producing anti-knock material from petroleum. Our own thought in the matter is that either by an oxidation process, referred to above, or by a dehydrogenation utilizing certain aerogel catalysts which have been developed in our division, we might be able to produce compounds in the product of high anti-knock value.

Acetylene, the source of many synthetic compounds and the gas which is used for cutting steel and for various other purposes, is now being produced by passing refinery gases through an electric arc. One well known organic chemist made the statement some years ago that acetylene will be the chief source of raw material for a gigantic chemical industry.

There are many other problems that are worth considering for research in connection with the utilization of petroleum. We will mention only a few: synthetic resins, for use in our new lacquers, varnishes, enamels, etc.; synthetic rubber; and fatty acids formed by the oxidation of kerosene and paraffin wax to be used in the compounding of rubber and in the preparation of special soaps, etc.

Synthetic Stone

The Chemical Engineering Division of Purdue University has treated the native shales with lime and water under pressure to produce a truly synthetic stone of unusual merit. This is one of the most interesting developments in the field that has occurred in many years. The State of Illinois has available in enormous quantities raw materials for this type of product, and it is easily conceivable that further work along these lines will mean the production of a superior stone.

Silica

There have been developed in the Chemical Engineering Division here at the University of Illinois extremely porous materials known as aerogels made from mineral materials. The silica aerogel has been reported by outside organizations to be one of the finest heat insulators ever produced. Undoubtedly this product, which can be easily made from mineral resources within the State, should be studied thoroughly in order to determine its practical feasibility.

These aerogels are being investigated by us as catalysts. Owing to their enormous surface, they bring about a marked acceleration of many gas reactions.

The solution of all problems involving the utilization of our mineral resources depends on the successful application of chemistry, physics, and mathematics. The application of these sciences to industrial problems is the basis of work in Chemical Engineering.

Demand Rises for Liquefied Petroleum Gases

Marketed production of liquefied petroleum gases totaled 48,173,000 gallons in 1934, a gain of 23.7 per cent. over the 38,931,000 gallons reported for '33, according to the U. S. Bureau of Mines, Department of the Interior. This represents an increase of 9,242,000 gallons for '34 over '33, the largest gain in demand for any year excepting '31. The following table illustrates the rapid expansion in the marketed production of liquefied petroleum gases during the period 1928-1934.

Year	Total marketed production in Thousands of gallons	Increase over previous year Thousands of gallons	Per cent.
1928	4,523	3,432	314.6
1929	9,931	5,408	119.6
1930	18,017	8,086	81.4
1931	28,770	10,753	59.7
1932	34,115	5,345	18.6
1933	38,931	4,816	14.1
1934	48,173	9,242	23.7

Propane, butane, pentane and propane-butane mixtures are the liquefied petroleum gases covered in this annual survey. The gain in demand for butane was again outstanding, the total for '34 increasing to 25,553,000 gallons or 34.1 per cent. over '33. The market for propane in '34 was 18,681,000 gallons compared with 15,835,000 gallons in '33. Deliveries of pentane and propane-butane mixtures were slightly less in '34 totaling 3,939,000 gallons compared with 4,040,000 gallons in '33. Sales of pentane considered separately were of minor importance, totaling only 832,000 gallons in '34 and 814,000 gallons in '33.

A study of the various demands for the several gases covered in this survey shows that the industrial requirements for butane increased from 12,180,000 gallons in '33 to 19,443,000 gallons in '34, while the quantity used for gas-manufacturing purposes declined from 6,170,000 gallons in '33 to 5,064,000 gallons in '34. The domestic demand for butane in '34 was 1,046,000 gallons compared with 706,000 gallons in '33. About 900,000 gallons more of propane were consumed for domestic purposes in '34 than in '33; however, a more significant gain in the consumption of this gas was made in the industrial field, the demand increasing from 1,300,000 gallons in '33 to 3,119,000 gallons in '34. Deliveries of propane for gas manufacturing in '34 were 326,000 gallons compared with 200,000 gallons in '33. Pentane and propane-butane mixtures used by gas manufacturing plants in '34 declined to 900,000 gallons from 1,948,000 gallons in '33. Sales for domestic purposes were also less last year, but pentane and propane-butane mixtures delivered for industrial purposes increased from 507,000 gallons in '33 to 1,640,000 in '34.

Propane is used largely for domestic purposes in households beyond the reach of gas-company mains, but new uses are constantly being found for this gas by the manufacturing industries, particularly those requiring a close control of heat. Petroleum refiners use propane as a solvent in the manufacture of lubricating oils and as a refrigerant in dewaxing. Butane, which is used principally for industrial purposes, also serves as an enriching agent in gas manufacture. Recent experiments on the Pacific Coast indicate that propane-butane mixtures make a very satisfactory motor fuel for internal combustion engines. So far this use for automotive vehicles has been largely confined to heavy-duty trucks and busses, which run between fixed terminals, where supply points for these gases have been established.

The American Gas Association has cooperated with the Bureau in this review of liquefied petroleum gases by furnishing the following information regarding their distribution:

"Liquefied petroleum gas continued to gain favor among the small communities throughout the country during '34. Three new companies began operations bringing the total up to 72. These 72 companies supplied gas to approximately 30,000 customers in 171 communities in 28 states. Butane-air-gas with a heating value ranging from 520 to 600 B. T. U. per cu. ft. was supplied to 110 communities in 26 states by 59 companies. Undiluted butane and propane gas with a heating value of 2,800 to 3,000 B. T. U. per cu. ft. were supplied to 14 communities in California and Nevada by 6 companies. Seven companies in Maryland, Minnesota, New Jersey, North Dakota, Virginia and Wisconsin supplied 47 communities with undiluted propane gas with a heating value of 2,550 B. T. U. per cu. ft.

"Although no new communities in Canada were added during the year, persons living within a thirty mile radius of Calais, Maine, were given an opportunity to receive gas service by the formation of the Citizens Philgas Company. Milltown and St. Stephen, New Brunswick, continued to be supplied from Calais, Maine, while the plant at Three Rivers, Quebec, continued to supply that town."

Most of the material gain in demand for liquefied petroleum gases has been in the industrial field, where bulk shipments are the usual method of handling, consequently the quantity moving into consumption by tank car, tank truck and pipe lines increased to 32,794,000 gallons or 68.1 per cent. of all shipments in '34 compared with 24,515,000 gallons or 63.0 per cent. of the total deliveries in '33. Cylinder and drum shipments in '34 were 15,379,000 gallons.

Effect of Preheating Catalyst in Hydrogenation-Cracking of Tar

By C. H. S. Tupholme

DETAILS of the effect of preheating the catalyst in hydrogenation of tar are announced by the Fuel Research Board in their last report. The catalyst normally used for the hydrogenation-cracking of tar is prepared by mixing granulated alumina gel with a calculated quantity of ammonium molybdate, evaporating to dryness and finally heating to 120° C. The proportions are chosen so that the dry catalytic material contains 25 per cent. of ammonium molybdate. It should be pointed out that, under the conditions of hydrogenation-cracking, the true catalyst is molybdenum oxide—or, if sulfur is present in the material being treated, molybdenum sulfide—supported on alumina gel.

Thus prepared, the catalyst has been found to behave as a hydrogenating catalyst, but, on the other hand, to possess very little activity as a "cracking" catalyst. Attempts have therefore been made to treat the molybdenum catalyst in such a manner as to confer upon it the power to effect "cracking." It has not been found possible to improve the catalyst by adding small quantities of other compounds, but a very considerable improvement has been effected by subjecting the supported catalyst to an initial preheating treatment in air. Experiments have been carried out with the alumina-gel catalyst, preheated in air at temperatures varying from 400 to 650° C.

The experiments were carried out at a reaction temperature of 450° C., the raw material being a neutral hydrogenated oil boiling from 170 to over 360° C. Since this oil was practically free from sulfur compounds, some experiments were carried out with raw material to which sulfur had been added, so that the results should be comparable with those obtained from tar, which normally contains about one per cent. of sulfur. The yields of spirit distilling up to 170° C., which may be taken as a measure of the activity of the catalysts used, are set out in Table 1.

The catalysts prepared at 400, 500, 550 and 600° C., when used in the absence of sulfur, gave yields of spirit to 170° C., varying from 6.8 to 7.2 per cent.; the unpreheated catalyst gave a yield of 5.6 per cent. The agreement between the yields of spirit obtained from the same preheated catalysts used with sulfur was not so good, but the maximum variation was from 12.5 to 14.1 per cent. All the yields were greater than that obtained (*i.e.*, 10 per cent.) from the unpreheated catalyst. The catalyst preheated at 650° C. gave results very much inferior to those obtained with the catalyst preheated at lower temperatures and with the unpreheated catalyst. This inferiority was especially marked in the experiment in which sulfur was added; the spirit yield was only 7.3 per cent. It was found that the low activity of the catalyst preheated at 650° C., was due not to a loss of molybdic oxide by sublimation, but to some adverse influence of the conditions of preheating. It is evident that there is no advantage in preheating the catalyst at temperatures above 500° C., although accurate temperature control during preheating is not necessary provided the temperature does not exceed 600° C.

TABLE 1.

Effect of Preheating the Catalyst at Various Temperatures

Temperature of preheating, deg. C.	Spirit to 170° C. per cent. of weight of original oil: Catalyst used without sulfur	Catalyst used with sulfur
Not preheated	5.6	10.0
400	6.8	13.0
500	6.8	14.0
550	7.2	12.5
600	7.0	14.1
650	5.2	7.3

The catalyst consisted of impregnated alumina gel, containing 25 per cent. ammonium molybdate, preheated in air for 5 hours.

Further experiments were carried out and the following conclusions were drawn:

(1) The optimum conditions for carrying out the preheating treatment are as follows: the molybdenum catalyst, in a current of air, is heated fairly rapidly (in about one hour) up to 500° C., which temperature is maintained for about five hours. (2) Air is superior to nitrogen or hydrogen as a preheating medium. (3) No advantage is gained by heating the catalyst to the required temperature more gradually, nor in maintaining the preheating temperature for longer than five hours.

Experiments were carried out with pure compounds in an endeavor to discover the nature of the improvement effected in the catalyst by the preheating treatment. In the first instance, decalin was treated with preheated and unpreheated catalysts. Any difference in the "cracking" activity of the two catalysts should have shown itself in differing yields of low-boiling compounds, but actually no such difference was detected.

Experiments were then carried out with ethyl benzene using the same catalysts. The properties of the products are recorded in Table 2.

TABLE 2. Effect of Preheating the Catalyst.

Fractions of product		Yields, per cent. of weight of ethyl benzene: No catalyst	Unpreheated catalyst	Preheated catalyst
Up to 95° C.	Aromatic hydrocarbons	31.9	29.4	21.2
	Saturated hydrocarbons	...	7.3	20.3
95–130° C.	Aromatic hydrocarbons	2.3	2.5	2.8
	Saturated hydrocarbons	...	1.0	3.4
130–136° C.	Aromatic hydrocarbons	45.8	30.6	15.3
	Saturated hydrocarbons	...	4.7	4.7
Yield to 136° C.	Aromatic hydrocarbons	80.0	62.5	34.3
	Saturated hydrocarbons	...	13.0	28.4
Residue and loss		4.0	4.5	3.8
Total		84.0	80.0	71.5

These results suggest that the preheated catalyst differs from the unpreheated catalyst in possessing a more powerful activity as a hydrogenating catalyst.

New Products and Processes

A Digest of the Current Literature for the User of Chemicals

Driers and Alkyds

By Dr. W. Krumbhaar

Differences in drying power of varnishes containing turpentine, dipentene or pine oil are well known, and it has been observed that such variations are consequent upon such factors as new or oxidized turpentine being used or whether thinned at high or low temperatures. These changes are controlled by the peroxides in the turpentine. The peroxides can be determined quantitatively by means of an aromatic thio-phenol, cymene mercaptan, which is rapidly oxidized by peroxide oxygen. The estimation is carried out by adding excess of cymene mercaptan to the turpentine under examination and back titrating the excess with alcoholic iodine solution. The method is quite suitable for laboratory procedure and can be carried out by allowing the turpentine and cymene mercaptan to react for 36 hours, after which the titration with iodine is completed. A convenient method of expressing the peroxide is as milligrams of peroxide oxygen per c.c. of turpentine.

By using this method it is possible to estimate the peroxide content of the various types of turpentine and so obtain information of the effects of heating, prolonged storage and oxidation on the material. Turpentine which has been stored in tanks or casks gives a figure of one mg. per one c.c., and since one mg. of oxygen is of similar volume to one c.c. of turpentine such material contains its own volume of active oxygen. Increase in the peroxide content is not obtained by simple exposure to air except in a thin film, when some resinification takes place. In such cases the rise is to approximately one and one-half mg. per c.c. Blowing and agitation, however, can be effective in obtaining a maximum content of two and one-half mg. per c.c. Beyond this point it is not possible to proceed, even with the use of catalysts.

Heating of a sample of turpentine containing two and one-half mg. per c.c. for one-half hour at 100° F. results in a fall to two mg. per c.c., while one-half hour at 200° F. produces a fall to one and one-half mg. per c.c. A minimum content of 0.5 mg. per c.c. is obtained by heating under a reflux condenser and this amount is stable under distillation, hence, newly-distilled turpentine contains 0.5 mg. per c.c. Prolonged storage of samples containing 0.5, 1.0, 1.5 and 2.5 mg. active oxygen per c.c., under conditions which do not allow of evaporation but which allow ingress of air, show that they all become similar in peroxide content. That is, they arrive at a state of equilibrium at one mg. per c.c.

Practically, importance of these results can be shown from the fact that a varnish batch thinned in separate portions with turpentines having different peroxide contents gives interesting results. The sample with a peroxide content in the turpentine of 0. 5 mg. per c.c. dried in 14 hours; with 1.0 mg. in six hours; with 1.5 mg. in four hours; with 2.5 mg. in two hours. If, however, the samples are allowed to stand for several months, it is found that the drying times of all are in the region of six hours, the reason being that the peroxide content of the turpentine has come to the state of equilibrium.

Differences are found which can be explained along these lines, between varnishes which are thinned hot, and those thinned at ordinary temperatures. Here again, the differences disappear on storage. An important point is that the peroxides are not themselves driers, but only operate with catalytic driers. Peroxides of this nature also exist in hydrogenated naphthalenes, such as tetralin, and these can be estimated by means of titrating the iodine liberated from potassium iodide with standard thiosulfate solution. The use of benzoyl peroxide as a drying agent is remarkable, though 1-2 per cent. is necessary, and here again the catalytic action of metallic driers is necessary.

Turpentine of a known peroxide content is particularly suitable for investigating the valence of manganese and cobalt driers which exist in both di- and tri-valent forms or mixtures of both forms. The familiar color changes observed by adding turpentine to solutions of cobalt or manganese resinates are merely visible changes of the metals from one oxidation stage to the other. By means of such a distinct color change it is possible to follow the transition quantitatively, particularly with cobalt salts, since, by titration with turpentine of known peroxide content, the point at which a pure green color is obtained shows when two molecules of cobalt oxide have taken one molecule of oxygen. Further additions of turpentine do not produce any further color change, thus proving that cobalt compounds of a higher valence do not exist. These tests can be equally well carried out on oleates, stearates or naphthenates as well as resinates.

Blue cobalt compounds are also oxidized to the green form by peroxides present in tetralin, hydrosol, solvesso, etc., while the peroxides of linseed oil and those present in varnishes act also in a similar manner. The visible effect of these changes is an apparent bleaching of a film, since the green coloration is complementary to the yellow-reddish color of the linseed oil or varnish. This method of investigating the valence stages by means of turpentine can be applied to manganese salts in much the same way as for cobalt, but in this case the point of final oxidation is not so easily recognized, since, commencing with a light yellow color, it gradually darkens to a maximum point. The maximum brown coloration occurs when one molecule of oxygen has been added to two molecules of manganese oxide, indicating that the change is from the divalent to the trivalent stage.

It is of interest to apply this method of determination to commercial driers and especially those made in varnish plants. Experience along these lines shows that both valence stages exist at the same time and that the ratio fluctuates considerably. There is a distinct difference in characteristics of the valence forms of cobalt and manganese. Cobalt rapidly assumes the trivalent form, while manganese under similar conditions takes several hours and only completes its change when the paint film is completely dry. The slow transition makes possible a comparison of the drying power of the two valence stages of manganese, and for this purpose equal amounts of di- and tri-valent compounds are added to oleo resinous varnishes and dried under similar conditions. The results of such an experiment show

that the trivalent form is capable of completing the drying in several hours less time than the divalent form. Since this would suggest that the trivalent salt is in a more suitable form to liberate oxygen, it may be of practical importance.

To apply this method of investigation to the valence changes in lead driers would be of interest, but, unfortunately, there is no distinct color change to mark the transition. It can, however, be applied to cerium compounds which pass from a light green to a distinct orange color when turpentine is added.

Observations on the different stages of oxidation give support to the theory that the drying effect of metals is connected with valence changes in that the metal in the trivalent stage gives off oxygen, itself returning to the divalent when it again becomes oxidized in air to the trivalent, the process continuing repeatedly. Along this line there is probably an explanation of the difference between cobalt and nickel in drying properties. Since nickel does not exist in the trivalent form under ordinary conditions, it is easy to understand its inert nature as a drier. The question of most importance is whether polyvalence is necessary to the drying action, and in this connection zinc and calcium might be cited as existing in only one stage of oxidation. It should be mentioned that these metals are only weak in action, and it seems to be established that for effective drying polyvalency is required.

Metallic catalysts used as driers are also effective in accelerating polymerization of oils and also the resin-forming reactions of alkyd resins. It is not possible to discuss the process in detail, but some of the rules governing resinification in the glycerol phthalate field can be pointed out. Materials with only one reactive group, such as monobasic acids and monohydric alcohols, do not form resins either with a polyreactive acid or a polyhydric alcohol. For instance, stearic acid does not react with either ethyl alcohol or with glycerine. A second rule requires the reacting substances to have more than one primary valence bond in order to make resin formation possible. Thus, two carboxyl groups or hydroxyl groups at least are required in the acids and alcohols used. This restricts the number of resin-forming alcohols, and the most important is the glycerine and phthalic anhydride combination.

These principles apply to the non-modified alkyd resins, but the majority of types now marketed are modified, and little has been mentioned of principles involved in the addition of either incorporated or chemically-combined materials. Simple addition of plasticizers such as tricresyl are not very satisfactory, and chemical modifications involving the use of molecular quantities are best suited. Drying oil and fatty acids impart their own properties, and these vary according to the number and positions of the double bonds. Modification with long paraffin chains produces increased oil-solubility in proportion to the length of the chain, but does not impart drying qualities. Introduction of fatty resinous or waxy substances produces flexibility, but not of the type obtained by substituting polybasic acids with long distances between the carboxyl groups, for example, phthalic acid. Abietic acid imparts oil-solubility and hardness, while fossil gums produce high melting points. Urea formaldehyde is incorporated to impart light color and to obtain color retention, while phenolic resin-forming materials give hardness and chemical inertness.

Alkyd resins modified with phenolic resins are highly versatile and universal, and those resulting from the use of phenolic condensation products described in the Hoenel patents are of special interest. These materials react to link up with any hydrogen atom of some reactivity in hydrocarbon structures. These phenol di-alcohols are specially useful in that they react with hydrogen atoms which were previously considered to be inert and produce a double tie which produces very stable compounds of great technical value.

To return to the problem of oxidation, it is interesting to consider whether metals in colloidally-dispersed form accelerate drying of oil. Lead, manganese or cobalt can be dispersed colloidally in butyl alcohol by use of an oscillating electrical discharge, and such dispersions are fairly stable. These colloidal solutions can be further stabilized by being thickened with oil immediately after dispersion. Of the three metals, lead is the most easily dispersed, but gives very dark solutions which, when added to linseed oil, quickly become much paler, the lead going into solution. In the case of manganese dispersions, the rate of solution is very much slower, and the effect on the drying of the oil can be watched. This paper, read before the Manchester Section of the Oil & Colour Chemists Association and printed in *The Chemical Age*, states that the result of these investigations is to establish that only when the metal has passed into solution does it exert a drying effect, and that the colloidal dispersions of metals have no catalytic drying action.

Rubber

An important development in the alkali process for reclaiming rubber is given in U. S. P. 1,998,449, owned by Pennsylvania Salt Mfg. Co. By introducing the proper amount of calcium hypochlorite or other similar reagents into the rubber scrap digesting operation the following advantages are claimed:

For the first time the alkali reclaiming industry is enabled to produce reclaimed whole tire stock free of cellulose as determined by official test.
30% less caustic soda can be used.
20% less softening oil can be used.
Types of scrap not responsive to the regular alkali process can be successfully reclaimed.
Refining-mill tailings are reduced by about 20%.
Speed of refining is increased approximately 15%.
Over all refining efficiency is substantially improved.

Many chemical equivalents of calcium hypochlorite for use in this process have been investigated by the patentees, and further patents are pending. Company is marketing a product containing the correct amount of caustic soda and hypochlorite under the name of Pennex.

Rubber-Resin

A rubber-resin, marketed as "Rubbone," covered by British Patent 417,912 (Rubber Growers' Ass'n) is prepared by oxidizing rubber catalytically and has the approximate composition of $(C_5H_8)_2O$. Dr. H. P. Stevens and W. H. Stevens, in the March issue of the "*Bulletin*" of the Association, indicate that future applications point to its use as a constituent of paints, varnishes, and enamels, for electrical insulation, particularly in the impregnation of coils, and the like, and possibly for molding purposes. The material is capable of further oxidation (drying), and of thermosetting.

Textiles

The latest contribution of the chemical industry to the textile world is a new material making possible non-tarnishable metallic fabrics, announced by the Fabrics & Finishes Department of du Pont. It is made of metallized slit cellulose film, and is manufactured by depositing a non-tarnishable metallic finish on one side of a sheet of Cellophane. Company claims it will not tarnish or oxidize, thus solving a problem which has always proven difficult in the production of metallic textiles. New material, designed for decorative use, is adaptable to many purposes in the industrial field.

Month's New Dyes

Established dyestuffs for cotton and wool have been placed in production by Sandoz. Known under the manufacturing name of Direct Fast Black B Supra, Sandoz is marketing this dyestuff under the selling name of Pyrazol Fast Black RCW. Manufacturer has placed in production the dyestuff Direct Chrome Black Blue B, which it will market as Viscoform Navy Blue GB conc.

General Aniline Works, through the General Dyestuff Corporation, is offering Indanthren Olive GNA paste, as a new

vat dye for the dyeing of cotton in its various forms, also for rayon and linen. Having good solubility and excellent leveling properties, it is well suited for use in machine dyeing. Possesses very good fastness to light and excellent fastness to washing and chemicals. It will prove of particular interest to piece dyers.

Other General dyestuff offerings include: Celliton Discharge Rubine 3BL, a color for acetate silk, producing full Bordeaux shades very easily dischargeable to a clear white. Well suited for application printing as it does not sublime. Benzo Fast Scarlet 4BSA, a direct dyestuff, producing bluish scarlet shades on cotton and rayon of good fastness to acid. Color will stain wool or silk but slightly. Leaves acetate silk practically white. Celliton Fast Red GG, a full, yellowish red for dyeing acetate silk, possessing very good fastness to light. Formyl Resist Blue G, a new acid dyestuff which produces a very bright shade of royal blue and is entirely stable to Rongalite; for which reason it is recommended for discharge printing on silks and wool. Color is easily soluble in cold water and is fast to light and washing. Supramine Bordeaux BA, a new acid color of General Aniline, released by General Dyestuff. Levels well from a Glauber's salt-sulfuric acid bath and produces bright bluish reds of good fastness to light. Is well suited for shading the wool in union dyeing and has also good affinity to silk. Katanol SL, a new wool resisting agent supplementing favorably the Katanol brands for union dyeing. Is easily soluble to a clear solution; soda is not required, the wool being almost completely resisted at 120-140° F. Product recommended for covering cotton and rayon in unions and in redyeing garments to overcome difficulties as regards penetration to seams. It is also of value in half-silk dyeing. Celliton Discharge Red GGL, an acetate silk red of excellent dischargeability, also well suited for direct printing.

Under the name "Calcoloid," Calco Chemical announces a complete line of practically dustless, colloidalized Vat Color Powders, developed especially for the printing trade. The standards indicated as—

Calcoloid Blue 2BD (Single and Double)
Calcoloid Yellow GCP (Double)
Calcoloid Violet 6RP (Double)
Calcoloid Orange R (Single and Double)
Calcoloid Pink FF (Single and Double)
Calcoloid Scarlet 2GHN (Single and Double)

are on a production scale, and further additions will appear from time to time.

Calcoloids, when added in dry form directly to the printing gum, will thoroughly wet out, disperse, or form a colloidal solution in the short time required to incorporate them in the gum.

A newly announced Calconese color made by Calco Chemical is "Calconese Scarlet GC." To the acetate dyer this product is recommended for producing yellow-toned scarlets of very good brightness.

Preservative for Cordage

A short article on the naphthenic acids was recently published in the *Textile Colorist*, and a note from Russia brings word of another interesting use for this type of material—the preservation of ropes, nets, etc., from their natural rapid deterioration. Compound used is naphthiol which consists of an ammoniacal solution of copper salts of naphthenic acid. The success of the treatment is such that a production of two thousand tons of naphthiol is planned for 1935.

Bromine for Wool Treatment

The substitution of bromine for chlorine in wool treatment to reduce shrinkage has noteworthy advantages as shown by S. R. Trotman and H. S. Bell ("*J.S.C.I.*," 1935, 54, 30T-33T). On scoured Botany yarn and web, any percentage of bromine produces much less damage than its equivalent of chlorine. Bromination of yarn leads to a slight increase of both tensile strength and extensibility. Brominated wool has an absorbing capacity for water and alkaline solutions intermediate between those of untreated and chlorinated wool; sodium carbonate solution removes less soluble nitrogen from brominated than from chlorinated wool, indicating less degradation. Generally speaking, the affinity of brominated wool for dyestuffs is intermediate between that of untreated and chlorinated wool.

Leather

That iron tanning is becoming a commercial possibility was one of the points stressed by D. Jordan Lloyd in an article in *The Leather World*, May 2, '35. Another suggestion made was that cobalt and manganese might also form the basis of mineral tannages. Chrome leathers are all green, iron leathers are brown, and other metals might give leathers of a more convenient color in the crust for special purposes. A mineral tannage which was white would have definite commercial value.

Organic Acids as Fungicides

Certain organic acids, by virtue of the greater ease with which they penetrate the living cells of the micro-organisms, are better fungicides for sheepskins than the stronger mineral acids. Acetic, benzoic, formic and salicylic are four of the fairly cheap organic acids which possess fungicidal and disinfectant properties. The objection of the cost of organic acids has been overcome in the use of sulfuric acid in addition to an organic acid. Mixtures of sulfuric acid, sodium chloride and sodium acetate form efficient pickle liquors which prevent the growth of very resistant molds on pelts. In the laboratories of the British Leather Manufacturers' Research Ass'n, reported in *The Leather World*, a number of pickle liquors containing sodium chloride and organic acids with and without sulfuric acid have been investigated, and it has been found that these organic acids will prevent mold growth far more effectively than sulfuric acid alone. Formic acid may be used either with the salt alone, or in conjunction with sulfuric acid in the pickle liquor.

Acetic acid and salt alone do not form a suitable pickle liquor. Concentrations of both sulfuric and acetic acids between 0.5 and 1.0 per cent., together with the 10 per cent. of salt, are suitable concentrations for use in pickle liquors. Similarly, salicylic and benzoic acids may be added to prevent mold growth and preserve the good general quality of the pickled pelt during storage.

Agricultural Chemicals

U. S. Department of Agriculture reports that a half-and-half mixture of calcium arsenate and lime is as effective for the destruction of boll weevils as the straight calcium arsenate.

Parasiticide

Process for a deadly insecticide is outlined in a patent obtained by Dr. Paul L. Salzberg, a chemist at Grasselli Chemical, in collaboration with Euclid L. Bousquet. Ingredients are: coconut oil, rhodanate, and a white alkaline solid.

Borax as Fungicide

Damage caused to the sugar beet by the so-called heart and dry-rot disease can be greatly reduced by the application of borax. In Germany, where this condition is common, the superphosphate industry has introduced two new fertilizers which contain borax in suitable proportions. They are "Bor-Superphosphate" (5% borax and 17/18% water-soluble phosphoric acid) and "Bor-Am-Sup-Ka" (2½% borax, 6% ammoniacal nitrogen, 8% water-soluble phosphoric acid, and 12% potash). From 4 to 5 quintals of the first product are required per hectare, and from 8 to 10 quintals of the second.

Chemical Specialties

"Nevinol," a new coal by-product oil has recently been added to the Neville Company's line. It is neither a resin solution, nor a soft resin, but is a separate polymer having a viscous liquid consistency and ranking as an intermediate high-boiling product between refined coal naphtha and paracoumarone-indene resin. There is no low-boiling solvent present, and it is almost completely non-drying at ordinary room temperatures.

The valuable characteristics of the product suggest its use in many places, such as plasticizer in pyroxylin lacquers, chlorinated rubber coatings, plastic compounds, fly paper, adhesives, non-drying inks, caulking compounds, water-proofing compositions, rubber resin finishes, aluminum paint vehicles and pastes, and wherever an unsaponifiable, neutral, substantially non-drying, viscous oil is required.

De-Inking Newspaper Pulp

An important step has been evolved in the perfection of a process for removing carbon ink from newspaper and reclaiming the original pulp from which the paper was made in a condition suitable for the re-manufacture of newsprint. The Snyder-Maclaren process is also equally adaptable to remove color and ink from mixed papers of certain classifications. Sale of licenses under patent is being organized by the De-Inking Supply Corp., 122 East 42nd St., N. Y. City.

Rustproofing Processes

A rustproofing process which combines the characteristics of electroplated or galvanized surfaces with those produced by parkerization or atramentation, but claims the distinction of furnishing complete rust protection without an additional coating of paint or lacquer, has been developed in Germany. *The Chemical Age* reports that the Iroplat process consists in depositing a very fine coating of zinc by galvanic treatment of carefully-cleaned iron and steel objects in an appropriate electrolyte. The appearance of the coating is dull grey with a fine, velvet-like lustre. The coating is so thin that it does not alter the dimensions of the objects.

An entirely new method of rustproofing which, for the first time in the history of electro-chemistry, utilizes alternating current in the process, has been perfected by the Ford Motor Company and is now being used in its entire production of head and tail lamps at the Ford lamp plant at Flat Rock, Michigan. New process is considered as especially suitable for use in the Flat Rock operation, as it requires less room than other methods of rustproofing, and provides a surface which is ready for painting as it comes from the rustproofing machine. The only attention required before painting is to wipe off the surfaces to be painted with a clean cloth. Instead of the usual preliminary washing, the lamp shells are made "dirty" by wiping the surface to be painted with a cloth impregnated with low-grade gasoline. This puts an oily film on the surface and by the time the chemical action in the rustproofing machine has removed this film, the deposition of zinc from the rustproofing agent, zinc phosphate, is well under way and the desired smooth fin. .. obtained.

Fast Cutting Compound

Developed by the Lea Manufacturing Company, Waterbury, Conn., grade "L" Lea compound, is a patented greaseless material containing a coarse, sharp abrasive. It is recommended for replacing set up wheels in the fine numbers and for fast cutting down previous to buffing or coloring. One of the problems overcome was the difficulty incorporated in making the coarse, sharp abrasive adhere properly to the wheel and give good service, but this difficulty was overcome by the development of a new binder.

Coatings

Recent tests on kernels of seeds of the bagilumbang tree, brought here from the Philippines, established the fact that they contain nearly 60% of a pale yellow limpid oil which has marked drying properties, owing to the presence of a large content of glycerides of elaeostearic acid. Dr. G. S. Jamieson and R. S. McKinney, Bureau Chemistry and Soils, U. S. Department Agriculture, in reporting their findings to the American Oil Chemists Society, claim that this oil bids fair to become a rival of tung oil, being very nearly akin to the oil from the tung tree.

Colloidol Carnauba Wax

A self-emulsifying synthetic wax of unusual interest having all the characteristics of Carnauba Wax is being marketed by the Beacon Co., 89 Bickford st., Boston, Mass., under the name "Colloy-Wax." It disperses in water to form a water-wax emulsion of high stability and when coated on a clean surface, a hard transparent film is left on drying, which gives a high gloss. This may be augmented by a shellac solution. When used in a bright-drying or non-rubbing wax, it offers the following advantages:

Ease of manipulation, Self-emulsifying,
East of application, Self-leveling,
Dries quickly and becomes water-repellant immediately,
Gives a hard film of great durability,
Makes emulsions foolproof.

Miscellaneous

The principal pigment colors used for the process of coloring plasters and cements are: Whites, titanium and zinc; if these are too expensive, extra white Portland cement or white sand may be used. Blacks—manganese black, artificial black oxide of iron. Grey, a mixture of manganese black, carbon black, and powdered slate. Red, natural or artificial oxides of iron. Orange, mixture of red and yellow oxides of iron. Yellow—natural and artificial yellow ochre. Browns—burnt ochre, umber, manganese brown, and burnt sienna. Green, oxide of chrome. Blues—ultramarine blue and cobalt blue. H. Rabate, (*Peintures, Pigments, Vernis*) Feb., '35, p.30, gives also the main conditions with which pigments used for these purposes should comply: Their tinctorial efficiency should be as high as possible. They should be free from compounds, capable of reacting chemically, even after a long time, with mortar, lime or other constituents of plasters. They should not contain more than 12 to 15 per cent. by weight of calcium sulfate, which retards the setting of mortars and Portland cements. Their physical characteristics should be such that mechanical mixing with the mortars is easy and rapid. Generally, the insoluble organic colors are unsuitable owing to their lack of stability.

Imparting Anti-Oxidant Properties to Vegetable Oils

That vegetable lecithin imparts anti-oxidant properties to vegetable oils where autoxidation is catalyzed by an active metal, has been proved by E. I. Evans (*Ind. & Eng. Chem.*). Lecithin may serve as an efficient anti-oxidant in the production of edible oils if used in amounts of 0.05 to 0.1 per cent. by weight. The results quoted were determined with four different samples of vegetable lecithin, all obtained by the Bollman extraction process. The anti-oxidant property of vegetable lecithin is easily destroyed by heating above 65° C. Therefore the material should not be added to oils at a temperature higher than 50° C.

Booklets and Catalogs

Chemicals

A199. Barada & Page, Guinotte & Michigan aves., Kansas City, Mo. This well-known Mid-West distributor of industrial chemicals has prepared a very complete catalog of items handled, together with packaging, prices and other important data for buyers to have. Many specialties are also listed. Every consumer of chemicals in the Mid-West area will want one of these catalogs on file.

A200. American Colloid Co., 363 W. Superior st., Chicago. To this department this outstanding contribution to the literature on bentonite was really a revelation. Surprising are the number of uses, the technical data which this company is making available to bentonite users and those whose manufacturing operations or finished products are such as lend themselves to the uses of bentonite. The book, for it is really that, is gotten up in a loose leaf style so that additional information sheets can be readily added from time to time. In short, no textbook could be as up-to-date, and very few, if any, as complete.

A201. American Cyanamid Co., 30 Rockefeller Center, N. Y. City. "American Hortigraphs and Agronomic Review." To those who are laboring towards the goal of better crops and more intensive and intelligent tilling of the soil this publication is as important as the daily newspaper is to the average suburbanite. Station workers, fertilizer mixers and the farmers get the latest news from its crisp, concise, authoritative, and pleasant-to-read pages.

A202. Cliffs Dow Chemical Co., Marquette, Mich. Official announcement of the new company formed to take over the chemical division of Cleveland-Cliffs Iron. Significant is the statement: "While it will continue to produce those products identified with Cleveland-Cliffs Iron Co.'s Marquette plant, it will shortly announce several new materials of exceptional interest."

A203. Climax Molybdenum Co., 500 5th ave., N. Y. City. The Molymatrix for June is most interesting to chemical plant men for it discusses the importance of molybdenum for valves which must resist high temperatures and pressures, conditions that are becoming more every-day occurrences in the process fields.

A204. Commercial Solvents Corp., Terre Haute, Ind. Alcohol Talks for June is entirely devoted to a most important Commercial Solvents product, butyl alcohol. It is a beautifully done non-technical description of the famous Weizmann fermentation process and its additions and improvements. C. I. readers are eligible to become regular subscribers without cost through this department.

A205. E. I. du Pont de Nemours & Co., Wilmington, Del. *The Du Pont Magazine* for May is deceiving for the peacefulness and serenity of the front cover (boy with dog fishing) hardly prepares the reader for the veritable bee-hive of activity within the enclosed pages. Leading article is another of those highly instructive Brooks Darlington articles, this one on dyestuffs. Additional features deal with the new Haskell Laboratory of Industrial Toxicology; use of Cellophane in "Safeguarding Your Milk Supply; announcement of Pro-Tex a new cream for protecting the hands against dirt, paint and grease, etc., to mention but a few. This department continues to arrange for C. I. readers to receive this monthly regularly.

A206. Eastman Kodak Co., Rochester, N. Y. *Synthetic Organic Chemicals* for June discusses "Hexasubstituted Ethanes." Highly technical, but extremely interesting, as are all in this series to the research chemist.

A207. Foote Mineral Co., 4041 Ridge ave., Philadelphia Pa. Semi-annually *Foote-Prints* appears with highly instructive original contributions on chemicals, metals, alloys and ores. For June Gordon H. Chambers has written a very fine article on Chrome and the uses of the ore and the chemicals made from it. One can judge how interesting is the style Mr. Chambers (who is, incidently, secretary of the Foote Mineral Co.) employs from his opening sentence. Says he, "The chrome business seems to have one foot in a railroad car and the other foot in a tramp steamer." Another outstanding article is "Titanium Minerals In Welding Rod Coatings," by L. G. Bliss. Finally, Dr. Philip E. Browning of Yale's Chemistry Dept. reviews the recent articles in the technical journals.

A208. The Hercules Powder Co., Wilmington, Del. *The Hercules Mixer*, house organ extraordinary, features the Savannah plant of Paper Makers' Chemical in the June issue.

A209. Glyco Products Co., 949 Broadway, N. Y. City. Just out is a new revised catalog containing valuable information and formulae on emulsions, polishes, abrasives, disinfectants, bronze lacquers, synthetic resins and waxes, adhesives, etching pastes, cutting and spraying oils, soluble oils, etc. In addition to the above this catalog contains chemical tables readily accessible that the chemist and technical worker will find indispensable.

A210. The O. Hommel Co., Pittsburgh, Pa. "The Why and How of Bronze Powder" is a popular dissertation on the manufacture, use, formulae, etc., of this important material.

A211. The O. Hommel Co., Pittsburgh, Pa. *Ceramic Forum* is a monthly newspaper reporting the happenings in the ceramic field.

A212. E. F. Houghton & Co., Philadelphia, Pa. Houghto-Clean is a brief booklet describing the Houghton line of cleaning materials for metal working plants.

A213. Arthur D. Little, Inc., Cambridge, Mass. *The Industrial Bulletin* is a monthly report on what's new in science from the laboratory desks of one of the best known firm of consultants in the country.

A214. Magnus, Mabee and Reynard, 32 Cliff st., N. Y. City. May-June catalog reports important price revisions in essential oils.

A215. Mallinckrodt Chemical Works, St. Louis, Mo. The June price revision on fine, analytical and industrial chemicals is ready.

A216. Merck & Co., Rahway, N. J. This important supplier of fine and industrial chemicals issues a monthly price list. Buyers can receive this regularly for the asking. Let this department do it for you.

A217. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. Well-known Norman G. Hough, president of the National Lime Association, was invited in a recent Westinghouse Salute to the Lime Industry to speak over a coast-to-coast network on the subject, "The Social and Economic Importance of Lime." Here it is for C. I. readers in booklet form.

A218. Philadelphia Quartz Co., 121 S. 3d st., Philadelphia, Pa. Again *Silicate P's & Q's* deals in a most interesting way with some new and some old uses for silicates. Chemical specialty manufacturers are particularly urged to write for this monthly publication.

A219. Phosphate Rock Institute, 30 Church st., N. Y. City. The Institute, which, by the way, has as its secretary one of the best known and most popular men in the fertilizer industry, H. B. Carpenter, has just prepared a splendid chart of the deposits of phosphate rock in the U. S. Copies are available as long as the supply lasts.

A220. Standard Silicate Co., Koppers Bldg., Pittsburgh, Pa. The title of the new booklet is completely descriptive of its contents. Every silicate user should have "For Your Information, Here Are The Commercial Grades, Properties and Principal Uses of Standard Silicate."

Equipment

A221. Alsop Engineering Corp., 39 W. 60th st., N. Y. City. Alsop has just completed a new and enlarged catalog on the various types of equipment for mixing, labeling, filtering, stirring, labeling, etc., manufactured.

A222. Aluminum Co. of America, Pittsburgh, Pa. A new and completely revised edition of "Alcoa Aluminum and Its Alloys" is available. This is the most comprehensive booklet on aluminum.

A223. Aluminum Co. of America, Pittsburgh, Pa. *Aluminum News Letter* is a monthly publication devoted to reporting new uses for aluminum.

A224. American Meter Co., 60 E. 42d st., N. Y. City. Bulletin AG-2 completes a new series of 6 apparatus bulletins, AG-1 to AG-6 inclusive, now available in the loose leaf 8½ x 11" standard size for American Meter Co.'s Sectioniter binder. Literature is revised, up to date, describing and illustrating the following products: AG-1 Meter Provers, including the new Fine Reader and Rapid Meter Testing Apparatus, Cubic Foot Bottles, Hydropneumatic Meter Testers—AG-2 American Calorimeter, Sulfur and Ammonia Test, Hydrogen Sulfide Test, Specific Gravity Apparatus—AG-3 Wet and Dry Test Meters and Demonstration for numerous applications—AG-4 Recording and Indicating Demand Meters—AG-5 Protector Siphon Gages, Single Tube Pressure Gages and High Pressure Differential Gages—AG-6 Service Cleaners, including Drip Pumps, the New American Service Cleaner and the Providence Vacuum Tank.

A225. Automatic Switch Co., 154 Grand st., N. Y. City. A new booklet describes Solenoid operated valves for automatic and remote control of air, gas, steam and various liquids.

A226. The Cleveland Brass Manufacturing Co., 4600 Hamilton ave., N. E., Cleveland. This new presentation by this well-known manufacturer of Acimet chemical pumps and valves is not merely a superficial catalog. Complete engineering data is provided of such character that the booklet should be on every plant superintendent's "Five-Foot-Shelf" library.

A227. General Electric Co., Schenectady, N. Y. A new booklet, GEA 77H gives complete information on G-E Pyranol capacitors.

A228. International Nickel Co., 67 Wall st., N. Y. City. Another data sheet has been added—"Nickel Alloy Cast Irons and Their Special Applications in Petroleum Production Equipment."

A229. Linde Air Products Co., 30 E. 42d st., N. Y. City. *Oxy-Acetylene Tips* is a monthly publication devoted to articles on the subject of welding and its various ramifications.

A230. Link-Belt Co., 910 S. Michigan ave., Chicago. Recently off the press is a new folder No. 1414, covering a line of cost-reducing time-saving portable belt conveyors for industrial plants, for handling loose or bagged bulk materials of practically every description. The machines illustrated are fully described, and embody a number of recent improvements in design and construction.

A231. Link-Belt Co., 910 S. Michigan ave., Chicago. *Link-Belt News* is a monthly newspaper devoted to the problems arising in conveying and power transmitting machinery.

A232. New Jersey Zinc Co., 160 Front st., N. Y. City. Reprints of the article "Combining Materials," which appeared recently in *Modern Plastics* are available.

A233. Pangborn Corp., Hagerstown, Md. New booklet contains 24 big pages of vital information. It contains the most complete data on a dust collector that this company has ever published, and a copy should be in every file.

A234. H. W. Porter & Co., 825 Frelinghuysen ave., Newark, N. J. Discusses Term-O-Tile, a complete conduit system for the permanent protection, support, and insulation of underground pipe lines—hot or cold.

A235. Parker Rust-Proof Co., 2174 E. Milwaukee ave., Detroit, Mich. A new book describing this process is available to interested manufacturers and technical men. It also includes charts showing the results of tests of various finishing methods. Send for your copy.

A231. Parker Rust Proof Co., 2174 E. Milwaukee ave., Detroit, Mich. A new method of applying Bonderite is described.

A232. The Norton Co., Worcester, Mass. A complete line covering all types of abrasives, bonds, solid and segmental type, in a wide range of sizes to suit all common makes of disc grinders.

A233. The Patterson Foundry & Machine Co., East Liverpool, Ohio. An 8-page folder shows a number of striking photgraphs of Patterson equipment installations of various kinds in the process industries.

A234. The F. J. Stokes Machine Co., Philadelphia, Pa. *Process News* is an interesting monthly discussing various phases of the chemical and process equipment field and of new pieces of equipment being offered by Stokes.

A235. Sturtevant Mill Co., Boston, Mass. A new catalog showing latest designs in fertilizer machinery is ready.

A236. Surface Combustion Corp., Toledo. Again the monthly 4-page leaflet shows a wide variety of installations of gas-fired oven furnaces.

A237. The U. S. Stoneware Co., 50 Church st., N. Y. City. Bulletin No. 801 is one of the most comprehensive treatments ever accorded the subject of quick-setting acid-proof cements for acid-proof tank, acid-proof tower, and acid-proof floor construction. Arranged so that it can be inserted in the loose-leaf binders issued by this company to hold data sheets on chemical stoneware, etc.

Chemical Industries,
New York City.
25 Spruce Street,

I would like to receive the following booklets; specify by number: ....

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Name ....
Title ....
Company ....
Address ....

Booklets on containers, packaging, etc., reviewed on page 49

Plant Operation and Control

A Digest of the Current Literature for Makers of Chemicals

Construction Materials For Chemical Plants

By J. McKillop

Range of materials now available for the construction of chemical plant is greater than at any time in the history of the chemical industry, but it is not yet sufficient to meet all requirements.

Laboratory tests and testing of samples under manufacturing conditions are often unsatisfactory, except as indicators that the material has certain suitable qualities, because in many cases the actual work of shaping material, particularly metal, into plant items, alters the original structure of the material from which the test piece was taken to such an extent that it fails when put into use. Such failures may be due to changes occurring in the material during the process of shaping, welding, riveting, and caulking. It is always advisable, therefore, when testing a material which has shown promising qualities in sample form, to go one stage further before using this in actual manufacturing plants, and test, under manufacturing conditions, a small vessel on which a certain amount of shaping has been done.

Wood is employed for many items of plant which would be constructed in metal or alloy if these were suitable for the products being manufactured. Vats, tanks, filterpress plates, agitator propellers for mixers, are made from wood. Its strength is low in comparison with steel, but in many respects it is a convenient material. When, however, the plant is in contact with acid liquors at boiling temperatures, or where violent agitation is required, disintegration of wood fibre occurs.

The first lining of the non-metallic type to be developed for wood vats was ceramic tiles jointed with acid or alkali resisting cements. These have only been partially successful because it is not possible to obtain a perfectly non-porous jointing material equal to the tile nor to guarantee that the cemented joints will remain tight for any length of time without attention.

In recent years, rubber has been used to replace tile linings to a considerable extent. Immense strides have been made in the period in developing suitable adhesives for fixing soft rubber to metal, and now rubber-lined steel tank trucks are the accepted vehicles for the transport of hydrochloric acid in bulk, and rubber-lined steel tanks are employed for the storage of hydrochloric acid. Rubber-lined pumps and piping are now looked upon as common appliances for handling this highly corrosive acid. In some cases, wood filterpress plates have been replaced by rubber press plates for filtering acid solutions, and although the first cost has been high, they have proved to be an economic investment.

Quite recently a new anti-corrosive material has been employed, which possesses many advantages over wood and tile-lined wood vessels. This is a phenol-formaldehyde condensation product compounded with high-grade asbestos fibre, from which all traces of soluble matter have been removed. This material can be moulded into large vats, formed into pipes, valves, pumps, fans, and even made into screwed bolts. It is resistant to, and can be used for, boiling solutions containing hydrochloric acid. The smooth, impervious finish of the vats made in this material is a great asset when the vat is used for the manufacture of more than one product because of the ease with which it can be washed out; this is one of the defects of wood or tile-lined tanks. The material is not recommended for oxidizing acids or alkalies. This material has a future, and more should be known about its possible applications in the chemical industry.

Very few engineers have any real affection for stoneware, despite the fact that it served them faithfully through a difficult period when other materials were not known. Stoneware requires tender handling to get the best out of it, and, although it has been replaced to a large extent by inert metals, it still has a large sphere of usefulness. Like many other materials, it has improved immensely by the stimulus of competition, and one can now obtain first-class mechanical equipment in stoneware such as pumps, fans, etc., which are efficient and dependable. They are of good design, and differ materially from the designs of 10 years ago.

Undoubtedly the discovery of chromium-nickel steel was a boon to the chemical engineer, as it put at his disposal a material which would resist the action of nitric acid at practically all concentrations. The chemical engineer has, however, a mechanical engineering complex in his assessment of materials; and in connection with chromium nickel steel, workshops catering for the needs of the chemical industry had developed through years of experience a very strong mild steel complex, which was immediately applied to the fabrication of chromium-nickel steel plant items. There was a general tendency to treat this material during the construction stages in exactly the same ways as mild steel. Some of these early efforts were amazingly successful, and are still in use after 10 years' service in difficult operations, but some failures occurred for apparently no known reason. Welded tanks, gas pipes and vessels which had been tested and passed as satisfactory, split along the plate adjacent to the weld while lying on the site awaiting erection; welded flanges on pipes dropped off when they were being erected or during the process of making the first joint, and with these occurrences a considerable amount of alarm was created.

Later, softened and descaled plates were recommended for riveted work and heat treatment after welding for welded apparatus. With the plates in the softened and descaled condition, it was reasonable to expect that shaping, riveting, and especially caulking, would be more easily done. This, however, did not remove the trouble, because in caulking the riveted seams work hardening took place, and actually it was found possible to crack a plate along the seam by excessive caulking.

The mild steel complex is wrong in the construction of chromium nickel steel tanks and very great care is required. with the improvements which have been effected both in the composition of steels belonging to this class and the methods of fabrication, it is now possible to give a guarantee that plant properly made will do the work for which it was designed.

Long before chromium nickel steels were thought of in connection with chemical plant construction, castings made of iron and silicon were employed for highly corrosive conditions such as for condensers for nitric acid, with the object of replacing stoneware, glass and lead. The silicon content varied between 6 and 13%. This material is extremely hard and brittle, and the early attempts in large castings were disappointing owing to its inability to withstand changes in temperature without cracking. Here, again, many failures were due to the cast-iron complex being applied to material which only resembled cast iron in appearance; and it took a long time for suppliers and users to realize that a new technique was necessary for the design of plant made in this material.

Large quantities of chemically pure lead are employed in the chemical industry, on account of its resistance to attack by sulfuric acid at all concentrations up to 95% cold and 75% hot. Lead is easily worked into shape and welded by gas flame. It possesses a number of convenient qualities as a construction material, but is deficient in two very important features. It is low in tensile and compressive strengths, and has a tendency to creep at ordinary boiling temperature.

Attempts have been made to remedy these defects by alloying lead with other metals, while still retaining its acid resisting qualities; the most recent example of this kind has been in the addition of tellurium. The chief advantage this alloy has over chemically pure lead is that it can be permanently work hardened by cold working. If chemically pure lead is work hardened, it self anneals rapidly at ordinary temperature. The tellurium lead alloy can be cold rolled to give a tensile strength of 4,000/5,000 lb. per sq. in.

Extended corrosion tests are in progress, but it is not yet possible to state if the new alloy is equal to or better than chemically pure lead. It would be interesting to learn during the course of the next 12 months the experience of users of this material.

Lead is now fixed to steel so securely that the 2 metals can only be parted by a hammer and chisel, and even then it is not possible to effect a clean separation. The advantages of this combination will readily be seen for plant subject to temperature and pressure, or as vacuum receivers; strength is imparted to the lead by the steel reinforcement, its tendency to creep is stopped, and its corrosion resisting qualities are retained. Great care is necessary in the construction of homogeneous lead-lined items of steel plant, to ensure that the lining is free from pinholes and that adhesion of the lead to the steel is perfect.

New Metal for Nitric Acid Equipment

Aluminium has recently come into prominence as a suitable material for the construction of nitric acid plants, owing to its resistance to strong concentrations of that acid at temperatures up to 100° C. Storage tanks for 96% to 99% HNO_3 up to 60 tons capacity are made of 99.8% aluminium in welded construction, and it is a serious rival to chromium-nickel steel for that purpose. Aluminium drums are now being used for the transport of strong nitric, and have replaced to a large extent glass carboys packed in straw which were a constant source of danger both in transport and handling of this acid.

The important points to be observed in aluminium construction are that where the metal is used for contact with strong nitric acid it must be 99.8% pure, and that the welds are hammered to a homogeneous mass equal to the plate. Aluminium is not suitable for employment at high temperatures or in contact with caustic liquors.

Nickel clad steel plate is mild steel plate protected on one side with a homogeneous sheet of pure nickel. The nickel is firmly and permanently bonded to the steel plate, and is guaranteed not to separate from it under normal conditions of temperature change, pressure, vacuum, or deformation in forming. Where iron free liquid caustic soda is required, this appears an attractive combination of metals.

Enamelled plant should be electrically tested before it leaves the makers' works. In connection with the test mentioned, the vessel is filled within an inch or two of the top with a salt solution consisting of 1 lb. of salt to each 45 gallons of water. A metal filament, gas-filled, plain glass electric lamp of capacity determined by the size of the vessel, 60 watt for vessels up to 250 gal. capacity, and 75 watt for vessels of greater capacity and up to 450 gal., is connected with the phase side of a 240 volt single phase A. C. 50-cycle supply, and from the other pole of the lamp an exploring lead is suspended in the salt solution. A lead from the pan body is connected to the neutral side of the supply. The enamel lining to be tested is thus subjected to a supply pressure of 240 volts, and any excessive current leakage will be indicated by the glowing of the lamp. For a successful test, the lamps specified above must remain black, when observed under darkened conditions. The surface of the enamel above the water level must be dried carefully, for quite a small film of moisture is sufficient to cause leakage enough to light the lamp and so give rise to the false conclusion that the lining is faulty.

The electrical test would, of course, be applied in conjunction with the visual test such as is standard practice at most works.—*Chemical Trade Journal*, British, Apr. 5, p. 249.

Plant Equipment

Design and Construction of Drying Apparatus

Fundamental factors involved in the design and construction of drying equipment were reviewed by a British chemical engineer, E. A. Fisher, before the Chemical Engineering Group and the Yorkshire Section of the Society of Chemical Industry. He showed that in design the following are essential: (1) An adequate supply of heat for the evaporation of moisture. (2) Sufficient air to sweep away the moisture under the particular conditions in question—that is, the equilibrium which forms between the vapor pressure of the liquid and its partial pressure in the surrounding air—must be continuously destroyed. (3) Such control of temperature and humidity as will protect the product from injury. (4) Sufficient time for the escape of the moisture from the material being dried.

Factors governing the first 3 of these are fairly well understood; the 4th is governed by internal factors which operate mainly by affecting the rate of movement of water or vapor from the interior to the surface of the material.

All wet solids being dried under constant drying conditions exhibit a period during which the rate of drying is constant. At some definite moisture content, which may be called the critical moisture content, the rate of drying begins to decrease, and continues decreasing until drying ceases. In industrial drying operations complete dryness is rarely if ever attained, or even desired, no matter how long the operation of drying may be continued.

It is possible by varying the thickness and/or the drying conditions, even with the same material, to obtain drying curves in which the falling rate portion may be in 2 sections, or it may consist solely of a first section, in which rate of surface evaporation is the controlling factor, or of a second section, in which rate of moisture movement within the solid is the controlling factor.

This difference in type is of great significance from the point of view of practical industrial drying operations and the design of dryers, because if there is only one falling rate period and that of the first type, the rate of drying will be markedly affected by external drying conditions such as air humidity and velocity, and quite unaffected by the thickness of the material; whereas, if the single falling rate period is of the 2nd type, which is often the case with slow drying materials such as soap, the rate of drying will not be affected by the drying conditions, but will be affected, as an inverse function, by the thickness of material.

Petroleum Chemicals

Naphthenic Acids Are Little Known

Prof. Dr. I. V. Braun reports in the June 15th edition of the *Chemiker-Zeitung* (summarized in the June 21 edition of the *Chemical Trade Journal* of London) on the naphthenic acids. He defines them as all the carboxylic acids occurring in mineral oils and not simply those of the naphthenes themselves.

Technical naphthenic acids, as prepared from their sodium salts, are more or less dark, unpleasant smelling liquids which boil at about 120° C. under 12 m.m. pressure. They contain both phenols and hydrocarbons, and their efficient purification on a commercial scale is still largely an unsolved problem. On the laboratory scale they can best be purified by esterification with methyl alcohol, purifying the ester and finally hydrolyzing this latter; but even after repeating this operation 2 or 3 times, the whole of the impurities are not removed.

Recent work has shown that in most varieties of mineral oils—namely, oils from Germany, Roumania, Baku, Japan, Texas, California, and Venezuela, there are 3 types of naphthenic acids—namely, paraffin carboxylic acids, monocyclic acids, and bicyclic acids. The first type usually embraces products with 6 or 7 carbon atoms. The 2d type covers products with from 8 to 12 carbon atoms, while the 3d type includes materials containing up to 23 carbon atoms. Content of a mineral oil in naphthenic acids rarely exceeds 2%, and is frequently lower than 0.1%. Oils poor in paraffin are relatively rich in naphthenic acids; and oils rich in paraffin, poor in naphthenic acids.

Chief sources for commercial naphthenic acids are Russian and Roumanian oils, and to a lesser extent Polish oils. Comparatively small quantities are obtainable from American and German oils. It is seen that even with a content of 0.1% in crude petroleum, the total world annual potential production of naphthenic acid today is about 200,000,000 kilogs.

Acids are purified technically by numerous methods, among which may be mentioned treatment with fuming sulfuric, with various oxidizing agents, with aniline, with ortho-toluidine, or with glacial acetic and petroleum ether. Glacial acetic dissolves the naphthenic acids, while petroleum ether dissolves the hydrocarbons. The acids purified by commercial methods are colorless, or almost colorless, but still possess a disagreeable smell. Their physical properties depend on the exact nature of the acids making up their composition. Chemically they react as an ordinary monobasic organic acid. The most important salts, the sodium salts, are less hydrolyzed than the usual sodium soaps, and have a stronger emulsifying power. The calcium, aluminium, and heavy metal salts are soluble in benzol, benzine, etc., and remain after evaporation as a plastic-elastic colored mass.

Recent technical applications of naphthenic acids include: Reduction of the viscosity of colloidal solutions; solution and regeneration of vulcanized rubber; to prevent gelatinization of tung oil on heating; as a constituent of fungicides; in the form of their esters, particularly with glycerines, in the preparation of synthetic resins and lacquers.

Sodium salts are employed to increase viscosity and lubricating properties of oils, to stabilize emulsifying of numerous water-insoluble products in water. Heavy metal salts are serving for the production of coating materials and as driers, while the copper salts find application in wood preservation owing to their antiseptic properties.

There is no doubt that once methods have been worked out for the separation of the various groups of naphthenic acids from one another, the field of application will be greatly expanded. It is likely, for instance, that the alcohols obtained by the catalytic reduction of the acids, and which are pleasant smelling liquids, are likely to find wide uses.

Safety

'34 Safety Experiences in Chemical Plants

The Chemical Section of the National Safety Council summarizes the outstanding facts about the 1934 experience as follows:

1. 1934 reports from 254 chemical plants, whose employees worked 217,509,000 man-hours, averaged 10.30 for frequency, in comparison with 15.29 for all industries; corresponding severity rates were 1.81 against 1.70.
2. Chemical plants tied with the non-ferrous metals industry for 9th place in frequency and ranked 20th in severity, in a list of 30 major industries.
3. The 1934 frequency rate is 5% below 1933 but the severity rate is up 6%; these changes compare favorably with increases of 5% in each rate for all industries.
4. The frequency of disabling injuries has decreased 58% since 1926 in comparison with a reduction of 57% for all industries, but in severity, the decrease is only 12% against 37% for all industries.
5. 1934 frequency rates are lowest in large units but small plants excel in severity.
6. Large plants had better records in comparison with 1933, than small ones.
7. 1934 injury rates were lowest in plants manufacturing carbon products, averaging 4.04 for frequency and 0.31 for severity.
8. Considering only certain types of chemical plants, pharmaceutical and fine chemical manufacturing units made the largest reduction in frequency in comparison with 1933, 22%, and vegetable oil manufacturing made the largest improvement in severity, 80%.
9. The most important types of compensable accidents in the chemical industry, according to state reports, are "handling objects" and "harmful substances," which account for 40% of all types.

Plant Operation

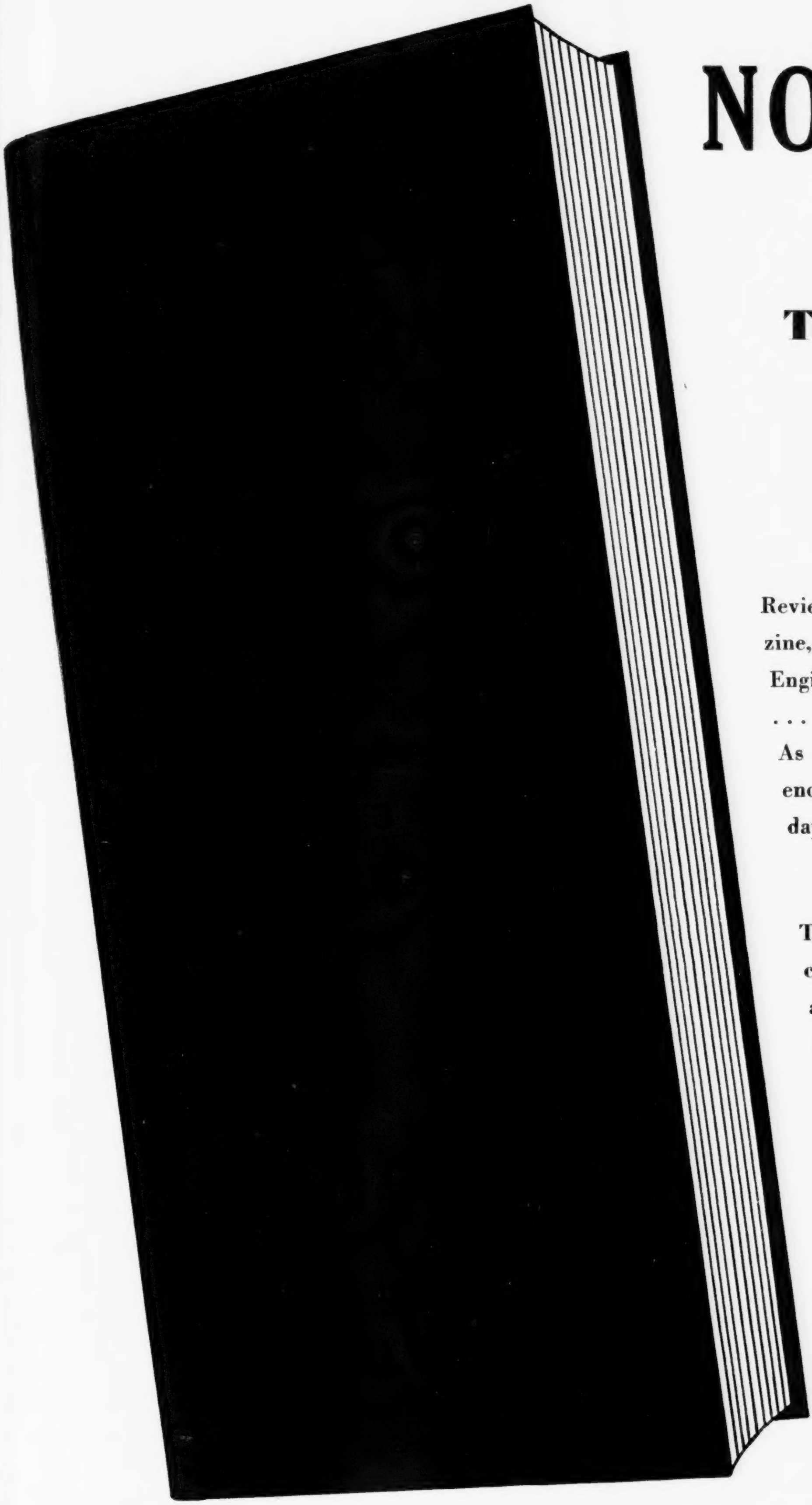
Necessity for Experimental Plant

The chemical engineer no more gambles the cost of a complete new plant on a new idea developed in his laboratory, than the wise man, confronted with a long and hazardous journey, entrusts all his eggs to a single basket. In both cases common sense suggests the trial first on a small scale, increasing in magnitude as success is realized, all of which was brought out at the recent A. I. Ch. E. meeting, first, by Charles J. Darlington and C. Chester Ahlum, both of Wilmington and connected with the Jackson Laboratory of the duPont Co., and then by F. C. Vilbrandt, Ames, Iowa.

Messrs. Darlington and Ahlum pointed out that semi-works or small scale development of new processes began in the research laboratory where the first question to be answered is whether or not the process will be financially profitable and, if so, what will the costs probably be. If the process survives these tests intact, like the proverbial egg, it next goes to a semi-commercial size plant for further arduous testing and so that enough of the new product may be made to ascertain demands from the trade. In this semi-commercial size plant, the period of "incubation" may vary from a few weeks to several years. In any case the new process does not go into large scale production until all the difficulties have been worked out on a small, relatively inexpensive scale. Only through such a period of carefully controlled "incubation" are prospects of eventual success reasonably assured.

Professor F. C. Vilbrandt explained that the term "pilot plant" denoted the twilight zone between the origination of the process in the chemical research laboratory and the final, continuous large-scale production. This, he said, was the chemical engineer's scheme for eliminating the old-fashioned and unreliable approach via the time-honored trial and error route.

The first step, he said, usually was on a very small scale, using pots, pans and pails to aid in the determination of yields, operating conditions and corrosion difficulties. Then came the second stage on a larger scale to reveal hidden difficulties and to yield sufficient final product for quality determinations and consumer tests. The final stage, conducted on a still larger



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Reviewing this new edition recently, the British magazine, "The Chemical Trade Journal & Chemical Engineer," of London, wrote as follows:
.... "Difficult to praise too highly .... As a directory it would be invaluable; as an encyclopedia of commercial chemicals for every day consultation it has no substantial rival."

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stage, served to settle such remaining doubtful points as operating cost, transportation problems, equipment needed, industrial hazards, by-product reclamation and waste disposal.

From start to finish, both speakers pointed out, the new process must be constantly checked and rechecked, step by step by a highly trained group of men, viewing it from the angles of research, development, chemistry, chemical engineering, mechanical engineering, marketing and management.

Detecting Overheating on Bearings and Kettles

Recent article in *Chemical & Metallurgical Engineering* reports a temperature sensitive paint, enabling plant foremen to detect overheating in bearings or kettles. When the temperature rises above a certain point the color changes. The formula as given is: Mix and grind one part of cuprous iodide with 2 parts of mercuric iodide and mix this with sufficient non-acid oil or spirit varnish. Applied to a surface this paint remains bright red up to 130° F. and then becomes darker as the temperature rises until it is almost black at 212° F. As the surface cools the paint resumes its normal color.

Inexpensive Method of Combating Corrosion

Francis Chilson, well-known production engineer, writing in his column, Production Forum, in *Drug & Cosmetic Industry,* suggests a means of preventing corrosion without recourse to corrosion proof metals. It is based on the principle that corrosion is essentially an electrical phenomenon. The stunt is used in chemical plants and also in industrial boilers. All you have to do is insert a small anode into the tank or kettle, as the case may be, and connect it up with a low voltage motor generator. The opposite wire should be connected directly to the shell to make it cathodic. This little trick has been turned in many cases where it was necessary to handle very corrosive solutions with ordinary steel equipment.

Redistilled Magnesium More Active

Redistilled magnesium is said to be much more chemically active than the ordinary commercial metal. It decomposes water at the ordinary temperature, the reaction proceeding for several hours until the metal becomes coated with magnesia. On exposure to pure and dry carbon dioxide, the metal gradually absorbs the gas at the ordinary temperature with formation of a small quantity of magnesium carbide.

Heavy Chemicals

Production of Sodium Aluminate

The chemical industry abroad has shown great interest in a method for the production of sodium aluminate directly from powdered aluminum hydrate (or bauxite) controlled by Penn Salt. The English patent covering the process is reported as No. 427,459.

In the process caustic and aluminium hydrate are mixed, the reaction taking place directly. The two may be reacted in a dry state, or a small amount of water insufficient to dissolve the caustic may be employed to ensure an intimate mixture. Water, if used, is preferably added to the aluminium hydrate in the mixer. Reaction takes place with the formation of hydrated sodium aluminate in the form of a plastic mass, and stirring and heating are continued until the hydrated product takes the form of a white crumbly mass. This is dried in a rotary kiln, through which hot air is passed. The product is a substantially anhydrous sodium aluminate, mixed with very little caustic and contains about 60% of soluble alumina.

Carbon Tetrachloride by Direct Chlorination

According to an Italian process (Patent No. 308,932) for producing carbon tetrachloride by direct chlorination of carbon bisulfide gaseous or liquid chlorine is used under pressure and at a temperature avoiding the production of intermediate chlorinated derivatives. The catalyst is selected from an element of the third or fourth periodic group.

Zinc Sulfate from Scrapped Rubber

Zinc sulfate is recovered from scrapped rubber tires in a 3-stage process, the first being one of devulcanization and plastication through heat application. A special solvent removes in the 2d stage all of the actual rubber, softeners, etc., leaving zinc oxide and carbon black. In the final stage dilute sulfuric is added which leaves the carbon black untouched while the zinc sulfate is recovered by crystallization of the solution.

Fine Chemicals

Citric from Wild Pomegranate

According to foreign reports, a new process for the manufacture of citric acid has been worked out using the juice of the wild pomegranate as raw material by the Biochemical Laboratories of the Leningrad Institute of Plant Nutrition. Plentiful supplies of the raw material are to be found in Transcaucasia.

A Discharge Through Tetrahydronaphthalene

According to an article appearing in *Metallborse,* May 15, and summarized in *British Chemical Age* of June 1, passage of a silent electric discharge through tetrahydronaphthalene results in formation of a whole series of low-molecular hydrocarbons (butane, propane, etc.), together with hydrogen. When treated in an apparatus similar to that used in the production of voltoils, tetralin also yields a highly viscous oil with a distillation residue suitable as a varnish resin. On the other hand, treatment in a so-called Geissler tube not only produces a viscous oil, but also a crystalline body with double the molecular weight of tetralin.

Solvents

Alcohol and Other Chemicals from Peat

The Irish Free State Industrial Research Council reports that experiments are under way to produce commercially wax, artificial silk, and industrial alcohol from peat.

Use of Irish peat as a declorizing agent for the purification of certain organic liquids is suggested by Prof. E. A. Warner before the Irish Free State Section of the Institute of Chemistry.

Formerly some 100,000 tons of air-dried seaweed was used annually for the production of iodine. This market has collapsed and the Council is endeavoring to find some industrial use for the seaweed.

Alcohol from Wood Uneconomical

H. Claassen (*Zeitung Wirt. Zuckerind,* '35, 85, p32-46) discusses the economics of the 2 processes (Scholler and the Bergius) for the hydrolization of waste wood to glucose and thence to alcohol, and comes to the conclusion that alcohol from wood sugar cannot compete on a cost basis with alcohol from beet molasses or potatoes.

New Solvent for Cottonseed Oil Production

An enormous economic saving to the cottonseed oil industry will be brought about by the recent discovery of a chemical solvent which will remove more oil from the seed at a lower production cost than the machinery method now used, Charles L. Lockett of Springfield, Ohio, said in an address before a recent joint meeting of the Tri-States Oil Mill Superintendents and the Oil Mill Machinery Manufacturers & Supply Association.

By means of the chemical process, oil extraction would be increased by as much as 5% while production costs would be lowered at least $3 per ton, Mr. Lockett said.

New Equipment

Valves with Colored Handles QC 258

Color is an indexing device of proved value. Its flashing signal that gets instant recognition has been employed in many ways to banish doubt and prevent errors and delays. Now, we find it applied to valves in the form of a new type of valve wheel which is molded of colored plastic materials. Just how important this type of valve wheel should be in chemical plants requires no elaborating upon.

Use of colored valve wheels in plants can prevent many accidents and costly mistakes.

This new wheel makes it possible to designate valves for steam, water, air or any other fluids and gases by distinctive colors. Five standard colors—blue, red, black, green and gray—are offered, unmarked or with 5 standard service markings molded in relief. The manufacturer also offers to make up wheels of special color or with special markings.

New Laboratory Stirrer QC 259

A fool proof laboratory stirrer has just been released. It is not just another mixer but a sturdy, well built accessory most useful for making emulsions; dissolving dyes, gums and resins, waxes and bitumens, pyroxylin, cellulose ethers, casein, glue, gelatin, starch, salts; extracting crude drugs and herbs, oil seeds, complex organic materials, etc. Actuated by a shaded pole type motor (110 V. 60 cycle) it will run 24 hours daily without damage. It is non-sparking and will not be injured by fumes and vapors. The speed may be varied as needed by the rheostat. It fits an ordinary clamp holder or may be screwed to a shelf or wall. The shaft and propellor are furnished in chromium plate or Monel. A flexible, 6 ft. rubber covered cord and soft rubber plug are included.

A Vibratory Screen with New Features QC 260

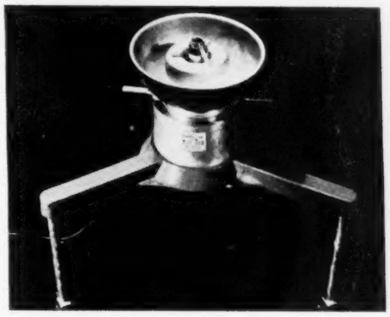
A new vibratory screen has 2 very important features—the ability to adjust the vibration to suit the material, and a simple method of holding in the cloths and permitting their quick replacement. This screen is of the type which has a vibrator element supported in an inverted, U-shaped metal frame. The sieve basket fits into a quick-set clamp at the bottom of this frame.

The vibratory motion is obtained through the use of a motor-driven unbalanced weight; it is controlled by adjusting the position of the weight. It may be exactly adjusted to the particular requirements of the material being screened by turning a small screw. The motor is hermetically sealed in a dust and explosion proof hood and operates on any lighting circuit.

The screen is easily portable. When in operation, it is usually suspended from any convenient support. It may be used for any liquid or solid material. It is the simplest and most efficient screen of its kind.

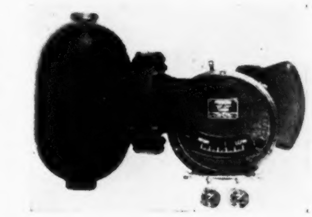
New Magnetic Separator QC 261

A new magnetic separator, the Frantz FerroFilter, is of interest to the pottery, ceramic material and enamel ware industries. The FerroFilter removes iron and other magnetic impurities from slips, glazes and slurries. It was designed by S. G. Frantz, consulting engineer, and consists of a separating chamber filled with highly magnetized screens or grids, fed by means of a hopper. The requirement for good separation on this kind of material is repeated passage of the liquid as close as possible to highly magnetized edges at as low a velocity as possible.



Liquid Level Control Instrument QC 262

A new type of liquid level control instrument is the Stabilog system of control added to specially designed friction-free ball float mechanism. This control instrument will maintain a level in a chamber within safe limits and at the same time gives a smooth out-flow without creating upsetting surges. Sudden increases in input that would ordinarily cause such surges are averaged out by the Stabilog. The Stabilog is designed so that it can easily be adapted to any type of installation. It may be installed with the ball float inside the pressure vessel, or on the outside with a kidney type float chamber.



Patented Magnetic Clutch QC 263

A newly patented magnetic clutch coupling insuring positive quick engagement and disengagement, with less than 1½ degrees of slip, is announced. Device has already found wide application on hot and cold strip mill secondary screwdown shafts, soaking pit covers and on many other applications where positive engagement and remote control is necessary or desired.

A Junior Roller Mill QC 264

A well-known manufacturer of roller mills has just completed a new junior size for use in situations where the larger sizes are not necessary. Paint companies particularly will do well to investigate its possibilities.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 258	QC 262
" 259	" 263
" 260	" 264
" 261	

Name ....

Title ....

Address ....

Packaging, Handling and Shipping

¶Cross, Continental Can, Reports on Packaging Styling—New Interesting Equipment is Announced—Notes on the Container Companies—Packaging Booklets—

The can's first duty is to sell itself off the shelf, but it should also continue to sell its contents and the name of the maker, as long as it is in use, according to John A. Cross, manager of the Development Dept., Continental Can. His conception of the container as a merchandising medium brings in new ideas which embody merchandising and advertising principles. Their consideration must, therefore, be based on a study of human psychology, says Mr. Cross.

Consider for instance the tin containers which are destined for the bathroom medicine cabinet. Many of them are flat, but in Mr. Cross' opinion this is often a mistake, because medicine cabinets are always crowded and afford poor visibility of the varied contents. A flat box will likely be laid flat, with something on top of it to save room, thus preventing the flat box from delivering its sales message. In one such case, he re-designed the customer's container into a tall, rectangular shape, which incidentally afforded space for a better closure. A package with more prominence and eye appeal, while in use, was the result.

On the other hand, it cannot be made a rule that flat packages are always undesirable. He instances the case of a metal polish which required detailed directions for its use. These had been printed on a tall cylindrical can which was crowded for space and made reading on the curved surface difficult. In this case he prescribed a flat can which not only afforded more room and easier reading but actually looked larger than the former model.

The matter of optical illusion is one which the can designer must always keep in mind, says Mr. Cross. He points out that various containers of the same capacity will often appear to be of different sizes because they are of different shapes. There is naturally a desire to use the largest appearing size where the container must stand on the shelf beside competitive goods and bid for the customer's choice.

Merchandising and advertising methods are constantly developing and improving, says Mr. Cross, pointing out that the progressive manufacturer keeps his methods in these fields up to date. The container of packaged merchandise is one of these merchandising and advertising methods and keeping it up to date in the principles of design is both necessary and beneficial.

Packaging Equipment*

A new small but fully automatic wrapping machine with a speed of 30 to 50 packages per minute is out with several interesting innovations.

A "Junior" Vacuum Filler

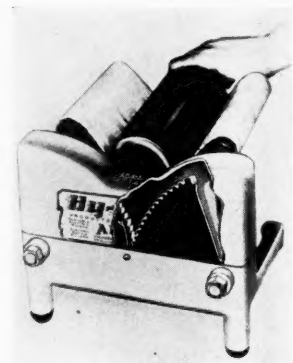
A new "junior" vacuum filler has just been announced for special use by the manufacturer who is dealing with lots of 25 to 50 gross per day. It is very economical to operate.

A New Idea in Design of Conveyor Belts

A new type of construction for open mesh, flexible, steel conveyor belts is reported. These belts are composed of formed spindles of flat steel, connected by pivot rods. In the old type of construction, the rods were strung through round holes, and the edge of the hole provided the only bearing for the rod. The new design, which reduces the wear of the rods, makes the hole elongated to a point where the entire flat surface of the U shaped section is utilized as a bearing.

Labeling Equipment

The Hy-Speed Stixit, an entirely new development in labeling equipment, has just been introduced. With one simple motion a wet gummed label of any size or shape is thoroughly and permanently fastened to a bottle without any wrinkles, unevenness or smearing of gum.



A flexible rubber belt connects the two protruding arms that operate on an enclosed gear arrangement. Label is placed on the bottle and the bottle is pressed gently on the belt (label downward). As the arms lower toward each other the rubber belt is wrapped snugly around the bottle pressing the label firmly in all spots against the bottle. When the bottle is removed the arms return to their original position.

Stixit can be used with any type label paster or gummer. It saves considerable time and labor that is ordinarily wasted in rubbing and wiping the labels on the bottles with rags. An absolutely clean, neat, finished label job on every package is assured at increased production speed. The new machine is simple, fool-proof, sturdily built and has only two moving parts. Anyone can run it at full speed instantly; no power is required in operation.

With the Container Companies

Wackman Welded Ware, one of America's largest steel drum makers, opens new Chester, Pa. plant.

C. Bennett of Bennett Brokerage, 223 4th ave., N. Birmingham, will represent Wilson & Bennett Manufacturing (containers) in that territory.

Packaging Booklets†

A239. Anchor Cap & Closure Corp., Long Island City, N. Y. An important announcement concerning a better method of packaging liquids in cans is disclosed in this new circular. The Amerseal nozzle has many advantages that the chemical specialty manufacturer and others will do well to investigate.

A240. Chase Bag Co., 250 W. 57th st., N. Y. City. *Bagology.* An unusual type of monthly that will appeal to every executive.

A241. General Plastics, Inc., North Tonawanda, N. Y. Closure News each month would keep you well posted on the subject of plastic closures.

A242. Harrisburg Steel Corp., Harrisburg, Pa. Announcing a new name for the former Harrisburg Pipe & Pipe Bending Co.

A243. The Hinde & Dauch Paper Co., Sandusky, Ohio. A new and intensely interesting book called, "Modern Box Design." As its title implies, this book deals strictly with the outward appearance of the corrugated fibre shipping box, which, by the way, calls for a thorough knowledge of design technique, color contrasts and color harmonies. This intriguing book presents the subject of shipping box design in an unusual manner. Descriptive copy is brief and numerous photographs serve to illustrate the various points discussed. If you use corrugated shipping boxes you will find this book extremely valuable in that it presents new and important uses for the shipping container. Certainly the manufacturer who believes in modern merchandising will not want to miss the information this book, "Modern Box Design," contains.

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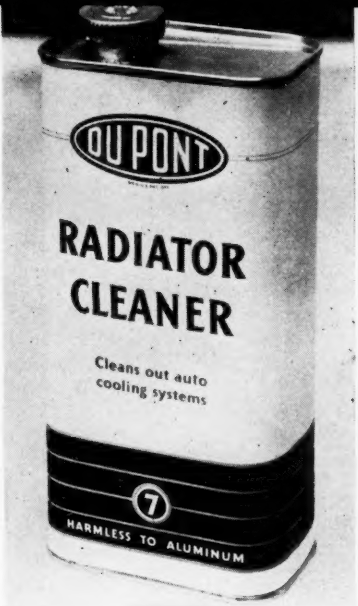
* This Department will gladly furnish the name and address of the makers of the equipment reviewed.

† Use the coupon in the Booklet Section, page 39.



Finishes Division of du Pont adds to its No. 7 line of chemical specialties a new radiator cleaner which will not rust or corrode, nor spot automobile finishes. Can design follows the general layout for the No. 7 group and is a product of American Can.

A twist and it is ready to pour. Anchor Amerseal Can nozzles were first tried out privately by several companies. A decided success, they are now available to all chemical specialty manufacturers. Besides ease of removal, they will gain customers for producers because of the ease of pouring permitted.

International Salt has redesigned the 10-lb. bag and the 5-lb. carton of Retsof Ice Cream Salt as the first move in a sweeping re-packaging program.

Two items particularly featured in the Mid-West chain stores last month. Drene, P. & G.'s sulfonated alcohol "soapless" shampoo, with sufficient product for 2 applications; Rite-Way White Shoe Cleaner, a big seller, "pushed" by a $1000 cash prize contest. Larger Chicago stores had demonstrators.

General Motor Parts is introducing a body polish. Simplicity of design is the outstanding characteristic of the container.

Summer months is spraying time and many of the more popular household insecticide brands are appearing with new labels and cans. Socony-Vacuum is staging a nation-wide campaign for "Bug-a-boo" shown at the right. All of the cans pictured are products of American Can and all indicate the decided trend to simplicity in design. Right, two new shoe whiteners in 10 and 25-cent bottles, have just been introduced by the Rand Products Co., Worcester, Mass., one for all white shoes and the other for kid and calf. A fine example of the "family" package.

U. S. Chemical Patents

A Complete Check-List of Products, Apparatus, Equipment, Processes

Agricultural Chemicals

Production fertilizer comprising ammonium nitrate, ammonium phosphate dilute nitric acid, phosphoric acid, ammonia gas, and another fertilizing agent. No. 1,999,026. Heinrich Tramm and Carl Clar, to Ruhrchemie Aktiengesellschaft; all parties of Oberhauser-Holten, Germany.

Composition for killing fungi and insects; consisting of soft soap, cresol soap solution, watery tobacco extract, a one-half normal potassium permanganate solution, vegetable glue, and alcohol. No. 2,000,843. Paul Janke, Ascona, Switzerland, to Dehne & Co. Orbono-Gesellschaft, Brissago, Switzerland.

Cellulose

Steeping press and method forming uniform alkali cellulose. No. 1,999,043. Stuart O. Fiedler, Kenmore, N. Y., to Du Pont Rayon Co., New York City.

Catalytic production of oxygenated organic compounds from a gas mixture comprising oxides of carbon and hydrogen. No. 1,999,388. Walter Bader and Edward Boaden Thomas, Spondon, near Derby, England, to Celanese Corp. of America, a corporation of Delaware.

Treatment with aqueous media of materials containing cellulose derivatives which contain soluble salts. No. 1,999,401. Wm. Alex. Dickie, and Percy Frederick Combe Sowter, Spondon, near Derby, England, to Celanese Corp. of America, a corporation of Delaware.

Production hydroxy aliphatic monocarboxylic acids and their salts. No. 1,999,403. Henry Dreyfus, London, England.

Process forming artificial bristles or straw of subdued lustre; first applying a suspension of a pigment in a liquid to a plurality of filaments of an organic derivative of cellulose, then applying a solvent. No. 1,999,404. Camille Dreyfus, New York City, and Wm. Whitehead, Cumberland, Md., to Celanese Corp. of America a corporation of Delaware.

Process forming stable cellulose acetates. No. 1,999,406. Camille Dreyfus, New York City, and Herbert E. Martin, Cumberland, Md., to Celanese Corp. of America, a corporation of Delaware.

Apparatus and method treating cellulose acetate in particle form with a liquid. No. 1,999,411. Clifford I. Haney, Drummondville, Que., Canada, to Celanese Corp. of America, a corporation of Delaware.

Production nitrated cellulose from wood. No. 1,999,572. Carl Johan Nordenswan, Ekenas, Finland, and Ray F. Schlaanstine, Kennett Square, Pa., to Hercules Powder Co., Wilmington, Del.

Fibrous esterification of cellulosic material in a bath containing, as a catalyst, perchloric acid and an aliphatic ether. No. 2,000,602 Carl J. Malm and Chas. L. Fletcher, to Eastman Kodak Co., all of Rochester, N. Y.

Preparation cellulose for esterification; pretreating it with a bath containing liquid sulfur dioxide. No. 2,000,603. Carl J. Malm and Chas. R. Fordyce, to Eastman Kodak Co., all of Rochester, N. Y.

Hydrolysis of an organic ester of cellulose in a hydrolyzing bath, consisting of a phenol and a basic nitrogen compound. No. 2,000,620. Cyril J. Staud and Louis M. Minsk, to Eastman Kodak Co., all of Rochester, N. Y.

Propionation of cellulosic material. No. 2,000,621. Cyril J. Staud and Russel H. Van Dyke, to Eastman Kodak Co., all of Rochester, N. Y.

Preparation a cellulose acetate composition, comprising a tertiary alcohol. No. 2,000,622. Ernest R. Taylor, to Eastman Kodak Co., both of Rochester, N. Y.

Method rendering compositions containing derivatives of cellulose more plastic; by incorporating and retaining in compositions a suitable hydroxycarboxylic acid. No. 2,000,927. Kenneth H. Crutchfield, Cumberland, Md. to Celanese Corp. of America, a corporation of Delaware.

Preparation an organic ester of cellulose of high resistance to heat. No. 2,000,934. Camille Dreyfus, New York City, and Leslie N. Lee, Cumberland, Md., to Celanese Corp. of America, a corporation of Delaware.

Production stable nitrocellulose gel; including nitrocellulose, a nitrocellulose solvent, finely divided metal powder, and a metallic salt. No. 2,001,070. Fred K. Shankweiler, Newport, and Walter E. Gloor, Wilmington, Del., to Hercules Powder Co., Wilmington, Del.

Production an aralkyl ether of cellulose; treating alkali cellulose with a mixture of an aralkyl halide and the corresponding diaralkyl ether. No. 2,001,102. Eugene J. Lorand, to Hercules Powder Co., both parties of Wilmington, Del.

Production a cellulose unit composed of laminations of cellulosic material bound together with an uninterrupted film of an adhesive oxy-cellulose viscose. No. 2,001,276. Irving Fink Laucks, to I. F. Laucks, Inc., both parties of Seattle, Wash.

Process for increasing extensibility and contraction of artificial fibers of regenerated cellulose; fibers being treated with an alkali solution and carbon disulfide. No. 2,001,621. Leon Lilienfeld, Vienna, Austria.

Chemical Specialties

Finish remover suitable for removing dried coats of paint, varnish and lacquer, of the wax, wax solvent and wax precipitant type. No. 1,999,165. Carleton Ellis, Montclair, N. J., to Chadeloid Chem. Co., New York City.

Preparation a detergent, consisting of a soap powder formed by heating and stirring a mixture of fatty acids. No. 1,999,184. Carleton Ellis, Montclair, N. J., to Standard Oil Development Co., Bayway, N. J.

Cement attaching of shoe parts; softening hardened cellulose derivative cement, by application to surface of cement a solution of a cellulose derivative in a solvent containing methyl formate. No. 1,999,295. Jos. W. Johnson, Beverly, Mass., to United Shoe Machinery Corp., Paterson, N. J.

Preparation for exterminating vermin in central heating plants. No. 1,999,524. Tor Gustav Wilhelm Molin, Gottenburg, Sweden.

Preparation a solid, grindable detergent, comprising Turkey-red oil, methylhexaline, tetra-hydronaphthalene sulfonate of sodium, and dehydrated trisodium phosphate. No. 1,999,628. Peter Friesenhahn, Berlin-Grunewald, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

Preparation detergent having lathering and wetting-out properties. No. 1,999,629. Peter Friesenhahn, Berlin-Grunewald, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

Preparation detergent comprising Turkey red oil, soda ash, and trisodium phosphate. No 1,999,630. Peter Friesenhahn, Berlin-Grunewald, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

Preparation detergent consisting of a soap, trisodium phosphate, and tertra-hydronaphthalene-sulfonate of sodium. No. 1,999,631. Peter Friesenhahn, Berlin-Grunewald, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

Preparation detergent composition. No. 1,999,632. Peter Friesenhahn, Berlin-Grunewald, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

Preparation emulsion containing a liquid nitrated polyhydric alcohol, water, and a water-soluble carbohydrate ether. No. 1,999,828. David R. Wiggam, Centerville, Del., to Hercules Powder Co., Wilmington, Del.

Preparation insect repellent, comprising a mineral oil solution of an alkyl benzoate. No. 2,000,004. Elmer W. Adams, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Production a composition enamel; including glue, ammonium hydroxide, alcohol, and chromic acid. No. 2,000,453. John J. Murray, Arlington, and Louis A. White, Medford, Mass.; said White assignor to Rogers Isinglass & Glue Co., Gloucester, Mass.

Process etching metal with a mordant comprising nitric acid and ammonium sulfate. No. 2,000,576. Ernest R. Boller, Cleveland Heights, Ohio, to Grasselli Chemical Co., Cleveland, Ohio

Coal Tar Chemicals

Production polynuclear aromatic amino bases. No. 1,999,069. Theodor Sutter, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Refining or purification of benzol, petrol, and like spirits; using ferric sulfate in process. No. 1,999,112. Thornton Scott, Oakleigh, Chelford, England, to Refiners Ltd., Manchester, England.

Manufacture carboxylic acid ketones and derivatives. No. 1,999,181. Courtney Conover and Carl V. Benz, St. Louis, and Franklin D. Smith, Kirkwood, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Production hydroxycarbazole compounds. No. 1,999,341. Friedrich Muth, Leverkusen-I. G. Werk, Germany, to General Aniline Works, Inc., New York City.

Conversion phenolic bodies and low-temperature tars into hydrocarbons. No 1,999,363. Andre Jean Kling and Jean Marie Felix Daniel Florentin, Paris, France, to Societe des Carburants Synthetiques, Paris, France.

Production amino-alkyl sulfonic acids; reacting a mineral acid ester of an amine with a neutral alkali metal salt of sulfurous acid in presence of water. No. 1,999,432. Heinrich Ulrich and Paul Koerding, Ludwigshafen-am-Rhine, and Ottmar Wahl, Leverkusen, Germany, to I. G., Frankfort-am-Main, Germany.

Production anthraquinono-2', 1', 1, 2-anthraquinones. No. 1,999,611. Georg Kranzlein, Ernst Diefenbach, and Martin Corell, Frankfort-am-Main, Germany, to General Aniline Works, New York City.

Preparation amino-alkyl sulfonic acids. No. 1,999,614. Otto Nicodemus and Walter Schmidt, Frankfort-am-Main-Hochst; Anton Ossenbeck, Cologne-Mulheim, and Ernst Tietze, Cologne-am-Rhine, Germany, to General Aniline Works, New York City.

Precipitation of metal halide addition compounds of diazonium halides. No. 1,999,723. Lawrence H. Flett, Hamburg, N. Y., to National Aniline & Chem. Co., New York City.

Method producing alkyl phenols. No. 1,999,793. Chas. A. Thomas, Wayne, Pa., to Sharples Solvents Corp., Phila., Pa.

Preparation resorcinol; monosulfonating benzene with sulfur trioxide in an inert solvent medium. No. 1,999,955. James Irvin Carr and Miles Augustinus Dahlen, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process heating o-cyanobenzamide in presence of a finely divided polyvalent metal. No. 2,000,051. Jocelyn Field Thorpe, Reginald Patrick Linstead, and John Thomas, Earl's Road, Grangemouth, Scotland.

Production carboxylic acid. No. 2,000,053. Walter Elwood Vail, to E. I. du Pont de Nemours & Co., both parties of Wilmington, Del.

Liquid-phase oxidation of aliphatic hydrocarbon material of high molecular weight. No. 2,000,222. Wilhelm Dietrich, Oppau, and Martin Luther, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Preparation ortho-dihydroxy compounds of the benzene series. No. 2,001,014. Frederick B. Downing, Carneys Point, N. J., Richard G. Clarkson, Wilmington, Del., and Harry H. Reynolds, Penns Grove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production nitrogen-containing anthraquinone derivatives. No. 2,001,044. Klaus Weinand, Leverkusen-I. G. Werk; Curt Bamberger, Cologne-Mulheim; and Hermann Utsch, Leverkusen-Wiesdorf, Germany, to General Aniline Works, New York City.

Production phthalic acid from phthalic anhydride; by reacting solid phthalic anhydride with steam No. 2,001,053. Lloyd C. Daniels, Crafton, and Alphons O. Jaeger, Mt. Lebanon, Pa., to American Cyanamid & Chemical Corp., New York City.

A technical Bzl, Bzl'-dibenzanthronyl substantially free of higher oxidation products. No. 2,001,063. Edward T. Howell, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture pyridino compounds. No. 2,001,201. Max Albert Kunz, Mannheim, and Gerd Kochendoerfer and Karl Koeberle, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Production 1, 4-diamino-2-aryloxyanthraquinone-3-sulfonic acid. No. 2,001,221. Berthold Stein, Mannheim, and Fritz Baumann, Leverkusen, Germany, to General Aniline Works, New York City.

Manufacture aniline from chloro-benzene and ammonia No. 2,001,284. Walter Prahl and Wilhelm Mathes, to Dr. F. Raschig G. m. b. H., all parties of Ludwigshafen-am-Rhine, Germany.

Production hydroxy diphenyl intermediates. No. 2,001,523. Walter G. Christiansen, Glen Ridge, N. J., and Sidney E. Harris, Lynbrook, N. Y., to E. R. Squibb & Sons, New York City.

Preparation a mercapto arylene thiazole; using mixture of a mononuclear arylamine and carbon disulfide. No. 2,001,587. Waldo L. Semon, Silver Lake Village, and Tirey Foster Ford, Akron, O., to B. F. Goodrich Co., New York City.

Method for dehydration of para-hydroxydiphenyl. No. 2,001,658. Wm. H. Williams, to The Dow Chemical Co., both of Midland, Mich.

Production 1-nitro-anthraquinone-6-acyl amino compounds. No. 2,001,-701. Earl Edson Beard, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production acylamino-anthraquinone compounds. No. 2,001,702. Earl Edson Beard, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production anthraquinone derivatives. No. 2,001,737 Ralph Norbert Lulek, to E. I. du Pont de Nemours & Co., both parties of Wilmington, Del.

Production anthrathiazole-anthraquinone carbonyl imides. No. 2,001,-738. Ralph Norbert Lulek, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del

Coatings

Production synthetic resin varnish; producing chemical reaction of condensation between a phenol and an aldehyde; using saponifiable wax and alkaline salt in last stages of process. No. 1,999,715. Horace P. Billings, Merchantville, and Dee A. Hurst, Haddonfield, N. J., to Radio Corp. of America, a corporation of Delaware.

Preparation coating composition having as ingredients nitrocellulose, hydrogenated methyl abietate, and a solvent. No. 1,999,812. Irvin W Humphrey, to Hercules Powder Co., both of Wilmington, Del.

Method providing a transparent protective coating for a sheet of ink printed paper, without sufficient penetration of the paper to affect the ink. No. 2,000,347. John D. Murray, Chicago, Ill., to Murray Liquafilm Corp., Chicago, Ill.

Liquid coating composition; aqueous solution of a water soluble adhesive, white oil, and mahogany sulfonate bodies, adapted to form a hard but flexible composition upon drying. No. 2,001,422. Hermann Heckel, to Emery Industries, Inc., both parties of Cincinnati, O.

Manufacture varnish composition; using China wood oil, boric acid, and an oil-soluble synthetic resin. No. 2,001,525. Roy E. Coleman, Meriden, Conn., to General Electric Co., Schenectady, N. Y.

Dyes, Stains, etc.

Manufacture chromiferous azo dyestuffs. No. 1,999,068 Fritz Straub and Willi Widmer, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production azo compounds. No. 1,999,185. Max Engelmann, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation color lakes, comprising mixture of one or more complex inorganic acids, a basic dyestuff, and a secondary alkyl amine. No. 1,999,395. Wm. S. Calcott and Paul W. Carleton, Penns Grove, N. J., and Harvey I. Stryker, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production unsulfonated azo dyestuff. No. 1,999,438. Gerald Bonhote, Basel, and Max Schmid, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Preparation easily water-soluble acid sulfuric acid ester derivatives of indanthrone dyestuffs. No. 1,999,477. Roger Ratti, Basel, Switzerland, to Durand & Huguenin S. A., Basel, Switzerland.

Preparation water-soluble azo dyestuffs. No. 1,999,610. Erwin Hoffa and Fritz Muller, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York City.

Preparation thioindigo dyes. No. 2,000,033. Herbert August Lubs and John Elton Cole, to E. I. du Pont de Nemours & Co., all parties of Wilmington, Del.

Production a shading stain, consisting of a water soluble acid aniline dye in solution in a rapidly volatilizing organic solvent. No. 2,000,120. Edward R. Bush, Lemont, Ill., to Chadeloid Chem. Co., New York City.

Preparation a wood stain composition; comprising a water soluble aniline dye, diethylene-glycol monoethyl ether, methanol, and toluol. No. 2,000,121. Edward R. Bush, Lemont, Ill., to Chadeloid Chem. Co., New York City

Manufacture azo dyestuff. No. 2,000,133. Josef Haller, Leverkusen-Wiesdorf, Germany, to Durand & Huguenin A.-G., Basel, Switzerland.

Production water-insoluble azo dyestuffs. No. 2,000,313. Arthur Zitscher, Offenbach-am-Main, and Wilhelm Lamberz, Leverkusen-Wiesdorf, Germany, to General Aniline Works, New York City.

Production vat dyestuff of the anthraquinone series. No. 2,000,348. Heinrich Neresheimer, Wilhelm Ruppel, and Anton Vilsmeier, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, New York City.

Method dyeing a nitrocellulose lacquer; admixing a dyestuff with a color adjusting agent consisting of an aryl-sulfamide, then dissolving by means of heat in the nitrocellulose lacquer. No. 2,000,393. Wolfgang Jaeck, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production fast tints on animal fibers; using chromium compounds of azo dyestuffs and dyebaths which, beside inorganic acids, contain aromatic baths. No. 2,000,794. Fritz Straub, Basel, and Herrmann Schneider, Richen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production direct developed azo dyes. No. 2,000,889. Ernest F. Grether and Gerald H. Coleman, to Dow Chemical Co., all parties of Midland, Mich.

Production ortho-hydroxyazo dyes. No. 2,001,010. Walther Benade, Dessau in Anhalt, Germany, to General Aniline Works, New York City.

Production acridone dianthrimide vat dyestuffs. No. 2,001,418. Ivan Gubelmann and Robt. J. Goodrich, So. Milwaukee, and Wm. Dettwyler, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production anthraquinone acridone vat dyestuff. No. 2,001,419. Ivan Gubelmann and Robt. J. Goodrich, So. Milwaukee, and Wm. Dettwyler, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process coloring oxide-coated aluminum; treating oxide-coated surface with a dye solution containing a weakly ionized acid. No 2,001,427. James Francis Leahy, to Atlas Tack Corp., both of Fairhaven, Mass.

Method coloring granules; first coating with a hydrous plastic clay, then applying second coating including sodium silicate, one of the coatings having a coloring pigment therein. No. 2,001,448. Milton R. Beasley, Norwood, Mass., to Bird & Son, Inc., East Walpole, Mass.

Production insoluble azo dyes. No. 2,001,526. Miles Augustinus Dahlen, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Explosives

Production explosive compound comprising mixed crystals consisting of a solid solution of sodium chlorate in sodium nitrate. No. 2,000,414. Eberhard Neukirch, Bitterfeld, Germany, to I. G., Frankfort-am-Main, Germany.

In manufacture of explosives, the process of handling normally moist highly sensitive materials. No. 2,000,995. Frederick R. Seavey and Edw. B. W. Kerone, Alton, Ill., to Western Cartridge Co., East Alton, Ill.

Preparation priming mixture, comprising a highly sensitive ingredient of the lead azide type in finely divided form, and a binder. No. 2,001,-212. Fredrich Olsen, Frederick R. Seavey, and Edward B. W. Kerone, Alton, Ill., to Western Cartridge Co., East Alton, Ill.

Manufacture copper ammonium salts of diazo amino tetrazole. No. 2,001,299. Willi Brun, Bridgeport, Conn., to Remington Arms Co., a corporation of Delaware.

Fine Chemicals

Production 3-menthene; bringing product containing 8-methanol in contact with a catalyst having a dehydrating action. No. 1,999,061. Walter Schoeller, Berlin-Westend, and Erich Borgwardt, Berlin-Pankow, Germany, to Schering-Kahlbaum A. G., Berlin, Germany.

Preparation primary diterpene-alcohols. No. 1,999,110. Leopold Ruzicka, Zurich, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production glyoxals. No. 1,999,576. Harry Lister Riley, So. Kensington, London, England, to Imperial Chemical Industries, Ltd., London, England.

Production polynuclear aromatic hydrocarbons. No. 1,999,738. Mathias Pier, Heidelberg, and Walter Simon, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Preparation higher alkyl esters of the organic carboxylic acids from lower alkyl esters. No. 1,999,976. Donald J. Loder, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Preparation glyoxalidinearylmethylols. No. 1,999,989. Max Bockmuhl and Robert Knoll, Frankfort-am-Main, Germany, to Winthrop Chemical Co , New York City.

Preparation glyoxal sulfate; reacting tetrachlorethane and oleum in presence of a catalyst for the reaction. No. 1,999,995. Melvin A. Perkins, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation benzanthronyl selenoethers. No. 1,999,996. Melvin A. Perkins, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation mixed benzanthrone-anthraquinone selenoethers. No. 1,999,-997. Melvin A. Perkins, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation anthraquinonyl selenoethers. No. 1,999,998. Melvin A. Perkins, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation benzanthrone selenoethers. No. 1,999,999. Melvin A. Perkins, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture certain para-n-sec-alkylamino phenols and other substituted phenols and their salts. No. 2,000,034. Randolph T. Major, Westfield, N. J., to Merck & Co., Rahway, N. J.

Production permanently set sheet of compressed, dry gelatin foam. No. 2,000,042. Samuel E. Sheppard and James H. Hudson, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Manufacture diaryl sulfones. No. 2,000,061. James Irvin Carr, Woodstown, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production lead alkyls; reacting an alkyl halide with a composition consisting of sodium, lead, and magnesium. No. 2,000,069. Frederick B. Downing, Carneys Point, and Louis S. Bake, Penns Grove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production an oestrogenous substance; treatment bituminous material and derivatives with organic solvents. No. 2,000,117. Selmar Aschheim, Berlin-Charlottenberg, Germany, to Schering-Kahlbaum A. G., Berlin, Germany.

Improved method manufacture manganese sulfur compounds; first passing relatively cool SO_2 into slurry of manganese ore containing MnO_2. No. 2,000,211. Howard B. Bishop, Summit, N. J.

Production hydroxy carboxylic acids. No. 2,000,213. Geza Braun, New York City, to Standard Brands, Inc., New York City.

Production acetals; reacting an alcohol with a vinyl ether while excluding water as far as possible. No. 2,000,252. Walter Reppe and Karl Baur, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Manufacture dental porcelain; fusing mixture containing feldspar with silica, fusing said product with a coloring agent, then fusing colored mixture with feldspar and kaolin. No. 2,000,285. Fred. P. Hoffmann, Evanston, Ill., to American Porcelain Co., Chicago, Ill.

Preparation alkali metal alcoholates; causing a vaporous alcohol to act upon a liquid amalgam of an alkali metal. No. 2,000,329. Paul Heisel and Eduard Bergheimer, Gersthofen, near Augsburg, Germany, to I. G., Frankfort-am-Main, Germany.

Preparation photographic developers for silver-halide emulsions, containing a sulfonic acid of an alkylated aromatic hydrocarbon. No. 2,000,-353. Albert Schaeffer, Marxheim in Taunus, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Preparation dihydroxybenzenearsonic acids. No. 2,000,361. Karl Streitwolf and Hans Hilmer, Frankfort-am-Main; and Alfred Fehrle, Bad Soden-am-Taunus, Germany, to Winthrop Chem. Co., New York City.

Production pyridinium iodides; condensing pyridine with a 2-iodopyridine alkyl iodide. No. 2,000,578. Leslie G. S. Brooker, to Eastman Kodak Co., both of Rochester, N. Y.

Preparation lactyl cellulose esters. No. 2,000,596. Wm. O. Kenyon and Russel H. Van Dyke, to Eastman Kodak Co., all of Rochester, N. Y.

Separation an acetyl-containing fatty acid ester of cellulose from the solvent in which it is dissolved; using precipitating bath of acetic acid and an ether. No. 2,000,601. Carl J. Malm and Chas. R. Fordyce, to Eastman Kodak Co., all of Rochester, N. Y.

Two-stage oxidation of a lower alkyl monoether of ethylene glycol to an

alkoxyacetic acid. No. 2,000,604. Carl J. Malm, Gale F. Nadeau, and Norman F. Diesel, to Eastman Kodak Co., all of Rochester, N. Y.

A dry, readily water soluble sodium alginate produced by mixing moist sodium alginate and sugar, then drying. No. 2,000,807. Rudolph J. Wig, Los Angeles, Cal., to Kelco Co., Los Angeles, Cal.

Production ether of hydroabietyl alcohol. No. 2,001,275. Clyde O. Henke, Wilmington, Del., and Milton A. Prahl, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture salts of ketoaromatic acids. No. 2,001,380. Lloyd C. Daniels, Crafton, and Alphons O. Jaeger, Mt. Lebanon, Pa., to American Cyanamid & Chemical Corp., New York City.

Production a secondary octylsalicylic acid; being a crystalline compound insoluble in water. No. 2,001,767. Herman A. Bruson, Germantown, and Otto Stein, Drexel Hill, Pa., to Rohm & Haas Co., Philadelphia, Pa.

Process improving perfume characteristics of an amyl cinnamic aldehyde as commercially prepared; by addition of diphenylamine. No. 2,001,788. Percy Joshua Leaper, Naugatuck, Conn., to U. S. Rubber Co., New York City.

Production photographic printing emulsion; comprising silver chloride, and a gold salt and lead salt as self-toning ingredients. No. 2,001,951. Wm. Ambler Berry, Knutsford, England, to Ilford, Ltd., Ilford, England.

Industrial Chemicals, Apparatus, etc.

Method distilling a higher fatty acid from stock containing it. No. 1,998,997. Lucius M. Tolman, Chicago, Ill., to New Process Fat Refining Corp., Chicago, Ill.

Distillation of fatty acids. No. 1,998,998. Lucius M. Tolman, Chicago, Ill., to New Process Fat Refining Corp., Chicago, Ill.

Preparation composition adapted for insulating and cooling purposes containing chlorinated diphenyl, trichlor benzene, and tetrachlor naphthalene. No. 1,999,004. Frank M. Clark, Pittsfield, Mass., to General Electric Co., Schenectady, N. Y.

Dyeing process for solidified drying oils. No. 1,999,170. Vernon R. Pallas, Cortlandt, N. Y.

Production condensation products; subjecting a secondary aliphatic alcohol to contact with a dehydrating catalyst. No. 1,999,196. Wilbur A. Lazier, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production hydrous silicate gels. No. 1,999,210. Ernest Wayne Rembert, Plainfield, N. J., to Johns-Manville Corp., New York City.

Process for continuous manufacture of ammonium salts; using sulfuric acid in process. No. 1,999,257. Arthur Ferdinand August Reynhard, Velsen-Noord, Netherlands, to Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, The Hague, Netherlands.

Production ethers; reacting together an alcohol and a halide in presence of aluminum and an acid-binding agent. No. 1,999,315. Alfred Wm. Baldwin and Alfred Davidson, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., London, England.

Manufacture a porous refractory resistant to moisture and high temperatures; mixing sand and a soluble silicate with a hydrated aluminum oxide. No. 1,999,382. Arthur S. Weygandt, Cleveland Heights, O., to Grasselli Chemical Co., Cleveland, O.

Apparatus for vaporization of formamide. No. 1,999,390. Harlan A. Bond, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process for dehydrating fluids containing highly reactive acetylenic polymers or compounds; by contacting with calcium carbide. No. 1,999,397. Thomas H. Chilton, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation composition consisting of activated carbon, Portland cement, calcium carbonate, water, and powdered aluminum. No. 1,999,499. C. J. Burgess, Liberty, Mo.

Condensation of organic acids and their anhydrides with aromatic compounds according to Friedel and Crafts reaction. No. 1,999,538. Philip H. Groggins and Ray H. Nagel, Washington, D. C., to Henry A. Wallace as Secy. of Agriculture, of U. S.

Production carbon black. No. 1,999,541. Theodore P. Keller, Elizabeth, N. J., to Doherty Research Co., New York City.

Process for absorption and distillation of ammonia. No. 1,999,546. Daniel Pyzel, Piedmont, Cal., to Shell Development Co., San Francisco, Cal.

Preparation coloring masses to be used for manufacture printing plates for polychromatic reproduction; comprising dextrin, glycerin, soap, talc, naphthalene, water, and pigment. No. 1,999,549. Serge Tchechonin, Paris, France, to Samuel Heller, White Plains, N. Y.

Production special carbon black of class formed by thermal liberation from a carbon-containing gas. No. 1,999,573. Wm. W. Odell, Chicago, Ill.

Process removing calcium sulfate from brines. No. 1,999,709. George N. Terziev, Solvay, N. Y., to Solvay Process Co., Syracuse, N. Y.

Manufacture lead styphnate; precipitating said salt in presence of free styphnic acid. No. 1,999,728. Edmund Herz, Berlin-Charlottenburg, Germany, to Remington Arms Co., a corporation of Delaware.

Preparation zinc chloride melts for granulation. No. 1,999,873. Frank L. Frost, Jr., Cleveland Heights, O., to Grasselli Chemical Co., Cleveland, O.

Method seasoning, preserving and tempering wood; impregnating wood with an aqueous solution of invert sugar, glycerin, aluminum sulfate, and anhydrous dextrose. No. 1,999,969. Geo. Elton Rice, New York City, to Conservation Corp. of America, a corporation of Delaware.

Apparatus for production ammonium sulfate. No. 2,000,038. Adolf Schmalenbach, Essen-Ruhr, Germany.

Manufacture colored compounds; heating a phthalimide and a metal in presence of ammonia. No. 2,000,052. Jocelyn Field Thorpe and Reginald Patrick Linstead, Earl's Road, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., London, England.

Manufacture formaldehyde. No. 2,000,096. Eugene Albert Prüdhomme, Lavallois-Perret, France, to Lucien Henri Roman, Paris, France.

Process forming acetylene; passing a gas mixture, consisting of equal volumes of methane and hydrochloric acid, through a tube of non-metallic refractory material. No. 2,000,118. David Binnie, Northwich, England, to Imperial Chemical Industries, Ltd., London, England.

Production a disabling gas generating chemical composition which generates irritating and disabling suspensions. No. 2,000,131. Byron C. Goss, Cleveland, O., to U. S. Ordnance Engineers, Inc., Cleveland, O.

Manufacture hydrocyanic acid. No. 2,000,134. Chas. Roberts Harris, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method preventing polymer precipitation in an aqueous formaldehyde solution. No. 2,000,152. Joseph Frederic Walker, Perth Amboy, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Extraction organic acids from molasses; by treatment with sulfuric acid, alcohol, and a non-solvent of sugars. No. 2,000,202. Eugenio Antonio Vazquez, Habana, Cuba.

Production gaseous mixtures containing hydrogen. No. 2,000,224. Otto Eisenhut, Heidelberg, Germany, to I. G., Frankfort-am-Main, Germany.

Method separation emulsions by electrical action. No. 2,000,018. Richard Heinrich, Berlin-Sudende, Germany, to Siemens-Schuckertwerke Aktiengesellschaft, Berlin-Siemensstadt, Germany.

Method electrical precipitation of suspended particles from gas. No. 2,000,020. Richard Heinrich, Berlin-Sudende, Germany, to International Precipitation Co., Los Angeles, Cal.

Method indurating clay materials; disseminating a small amount of caustic alkali throughout clay and heating to produce a non-vitrified product. No. 2,000,338. Max H. Kliefoth, Madison, Wis., to C. F. Burgess Labs., Madison, Wis.

Manufacture composite articles from a plurality of laminae of wood having a greater moisture content than seasoned wood; using a vinyl resin in process. No. 2,000,383. Harvey R. Fife, Pittsburgh, Pa., to Carbide & Carbon Chemicals Corp., New York City.

Apparatus for bringing a gas and a liquid into intimate contact. No. 2,000,443. Ingenuin Hechenbleikner, Charlotte, N. C., to Chemical Construction Corp., Charlotte, N. C.

Apparatus for bringing a liquid and a gas into intimate contact or mixture, as for absorption, scrubbing, or condensation. No. 2,000,444. Ingenuin Hechenbleikner, Charlotte, N. C., to Chemical Construction Corp., Charlotte, N. C.

Manufacture a laminated composite stationery paper for taking an inscription; consisting of a layer of metallic foil adhesively secured to external sheets of paper. No. 2,000,528. Garrett B. Linderman, Jr., Pittsburgh, Pa., to Pittsburgh Equitable Meter Co., Pittsburgh, Pa.

Process for simultaneously producing phosphoric acid and silicon alloys. No. 2,000,627. Marvin J. Udy, Anniston, Ala., to Swann Research, Inc., Birmingham, Ala.

Method curing concrete; covering exposed surface of concrete to be cured with a mixture of bitumen and rubber. No. 2,000,759. Arthur A. Johnson, Great Neck, N. Y.

Production a porous ceramic filtering body comprising siliceous particles of a splintery and feathery nature and a vitreous ceramic bonding agent. No. 2,000,777. Corwin R. Minton; one-third to Wm. B. Phillips, and one-third to Burdick R. Ells, all parties of Los Angeles, Cal.

Electrode for carrying out electrochemical reactions, containing active carbon, with a thin coating of an electrolyte repellant substance covering a part of electrode. No. 2,000,815. Ernst Berl, Darmstadt, Germany, to Mathieson Alkali Works, Inc., New York City.

Manufacture artificial skins and envelopes, particularly adapted for artificial sausage casings; shaping envelopes from cellulose-nitrates and denitrating with sulfohydrates. No. 2,000,836. Franz Goldberger, Breda, Netherlands, to Sylvania Industrial Corp., Fredericksburg, Va.

Production acetic acid; reacting propylene with an aqueous metal hydroxide solution, then separating an acetate product from reacted mixture. No. 2,000,878. Edgar C. Britton, Howard S. Nutting, and Myron E. Huscher, to Dow Chemical Co., all parties of Midland, Mich.

Method purifying tetrachloroethylene; using aluminum chloride during process. No. 2,000,881. Gerald H. Coleman, to Dow Chemical Co., both parties of Midland, Mich.

Method of heat transfer; using diphenyloxide. No. 2,000,886. Herbert H. Dow, deceased, late of Midland, Mich., by Willard H. Dow and Clara Turner, administrators, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Production alumina hydrate. No. 2,000,939. Arthur Fleischer, Hartford, Conn., to Kalunite Co., Philadelphia, Pa.

Apparatus for reacting semi-fluid materials. No. 2,000,953. Paul Hooker, Thomas L. B. Lyster, and John D. Rue, Niagara Falls, N. Y., to Hooker Electrochemical Co., New York City.

Process polymerizing mono-olefines to form mono-olefines of a greater molecular weight. No. 2,000,964. Samuel Lenher, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process revivifying fuller's earth. No. 2,000,973. Bert Manross, Warren, Pa.

Process reacting with oxygen and ozone upon acetaldehyde in presence of a solvent for acetic acid and acetaldehyde. No. 2,001,171. Karl Weibezahn and Felix Walter, Knapsack, near Cologne-am-Rhine, Germany, to Aktiengesellschaft fur Stickstoffdunger, Knapsack, near Cologne-am-Rhine, Germany.

Process treating brake lining and impregnating compound for same. No. 2,001,194. Olaus T. Hodnefield, Glendale, Cal.

Production fatty acid anhydrides. No. 2,001,211. Richard Muller, Heidelberg, and Erich Rabald, Mannheim, Germany, to C. F. Boehringer & Saehne, G. m. b. H., Mannheim-Waldhof, Germany.

Method improving dispersibility of calcium sulfates; incorporating therein small amounts of a soluble aluminum compound and an alkaline lime compound. No. 2,001,245. Orvon P. Gephart, Miamisburg, O., to Howard D. Meincke.

Method of and apparatus for conditioning gas or vapor. No. 2,001,259. Chas. E. Lucke, New York City, to Babcock & Wilcox Co., Newark, N. J.

Pulp treating process. No. 2,001,268. John D. Rue, Niagara Falls, N. Y., to Hooker Electrochemical Co., New York City.

Process making concentrated sulfuric acid or oleum. No. 2,001,359. Ingenuin Hechenbleikner, to Chemical Construction Corp., both parties of Charlotte, N. C.

Production arsenic-containing cement. No. 2,001,506. Gosta Johan Jakob Smitt, Vasteras, Sweden, to Bolidens Gruvaktiebolag, Stockholm, Sweden.

Manufacture a compound containing a hydroxyaryl group substituted on the nitrogen atom of a heterocyclic nucleus. No. 2,001,584. Marion C. Reed, Cuyahoga Falls, O., to B. F. Goodrich Co., New York City.

An improved Portland cement product, characterized in that the individual particles are spherical. No. 2,001,608. Chester G. Gilbert, Washington, D. C., to Research Corp., New York City.

Manufacturing packing plates having a wire grid coated with a plastic mass. No. 2,001,616. Karl Klinger, Gumpoldskirchen, near Vienna, Austria, to Naamlooze Vennootschap Irma Industrie en Ruhmaterialen Maatschappij, Rotterdam, Netherlands.

Apparatus for and process of reducing solvent losses in fabric cleaning. No. 2,001,656. Rudolf von Gruber-Rehenburg and Robert Stobe, Munich, Germany, to Dr. Alex. Wacker, Gesellschaft fur Elektrochemische Industrie G. m. b. H., Munich, Germany.

Preparation formic acid from carbon monoxide and steam. No. 2,001,659. John C. Woodhouse, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Method and apparatus for impregnating material. No. 2,001,768. James H. Campbell, Somerville, Mass., to James D. Moore, Dorchester, Mass.

Apparatus for utilizing heat of condensates. No. 2,001,784. Wilhelm Hofmann, Bitterfeld, Germany, to I. G., Frankfort-am-Main, Germany.
Apparatus and method of determining the tenacity of bonded granular bodies. No. 2,001,794. Romie Lee Melton, to Carborundum Co., both parties of Niagara Falls, N. Y.
Manufacture spark plug electrode; having as its major constituent a base metal such as nickel-cobalt metal, a metal of the alkaline earth group, and chromium. No. 2,001,888. Donald W. Randolph, Flint, Mich., to General Motors Corp., Detroit, Mich.
Manufacture abrasive articles; comprising a flexible backing and a plurality of blocks of bonded abrasive material attached thereto by a layer of resilient material. No. 2,001,911. Chas. E. Wooddell and Chas. S. Nelson, Niagara Falls, and Roy Lincoln, Buffalo, N. Y., to Carborundum Co., Niagara Falls, N. Y.
Production a thermal insulation unit; consisting of a base sheet with a highly polished heat-reflective non-metallic mineral film. No. 2,001,912. Martin C. Huggett, Chicago, Ill., to Research, Inc., a corporation of Illinois.
Process for direct conversion of water-soluble lower fatty acids with monohydric aliphatic alcohols into highly concentrated esters which are practically free from alcohols. No. 2,001,926. Gabor Torok, Budapest, Hungary.

Leather and Tanning

Tanning hides and skins for purpose of producing chrome leather adapted to be soaked again; using chromic salts of aromatic sulfonic acids in process. No. 1,999,316. Max Bergmann, Dresden, Germany, to Studiengesellschaft der Deutschen Lederindustrie G. m. b. H., Dresden, Germany.

Ores, Metals, Alloys, etc.

Manufacture welding electrode having a flux containing calcium and barium carbonates. No. 1,998,947. Jas. M. Weed, Ballston Lake, N. Y., to General Electric Co., Schenectady, N. Y.
Production ferrous alloy containing carbon, chromium, molybdenum, tungsten, silicon, manganese, vanadium, and iron. No. 1,998,953. Jos. V. Emmons, Shaker Heights, O., to Cleveland Twist Drill Co., Cleveland, O.
Production ferrous alloy containing carbon, chromium, tungsten, molybdenum, silicon, vanadium, and iron. No. 1,998,954. Jos. V. Emmons, Shaker Heights, O., to Cleveland Twist Drill Co., Cleveland, O.
Production ferrous alloy containing carbon, chromium, tungsten, molybdenum, silicon, cobalt, and iron. No. 1,998,955. Jos. V. Emmons, Shaker Heights, O., to Cleveland Twist Drill Co., Cleveland, O.
Production ferrous alloy comprising carbon, chromium, tungsten, molybdenum, silicon, vanadium, cobalt, and iron. No. 1,998,956. Jos. V. Emmons, Shaker Heights, O., to Cleveland Twist Drill Co., Cleveland, O.
Production ferrous alloy containing carbon, chromium, molybdenum, tungsten, silicon, vanadium, cobalt, and iron. No. 1,998,957. Jos. V. Emmons, Shaker Heights, O., to Cleveland Twist Drill Co., Cleveland, O.
Apparatus for concentration and/or sizing of mineral particles. No. 1,999,000. Felix Johan Tromp, Pretoria, Union of South Africa.
Production aluminum article having uniformly etched light-reflecting surface. No. 1,999,042. Junius D. Edwards, Oakmont, Cyril S. Taylor, New Kensington, and Welker Wallace Wentz, Pittsburgh, Pa., to Aluminum Co. of America, Pittsburgh, Pa.
Manufacture artificial filaments containing a finely divided titanic acid. No. 1,999,182. Camille Dreyfus, New York City, and Wm. Whitehead, Cumberland, Md., to Celanese Corp. of America, a corporation of Delaware.
Recovery zinc from its ores; oxidizing the metal values of the ore, adding carbon, a chloridizing agent, and water. No. 1,999,209. Augustin Leon Jean Queneau, New York City.
Method recovering ilmenite and apatite concentrates from nelsonite ore. No. 1,999,825. Byramji D. Saklatwalla and Holbert Earl Dunn, Crafton, Pa., to Southern Mineral Products Corp., New York City.
Production copper-iron alloy, comprising copper, magnesium, and iron. No. 1,999,850. Cyril Stanley Smith, Cheshire, and Earl W. Palmer, Waterbury, Conn., to American Brass Co., Waterbury, Conn.
Production an alloy containing palladium, platinum, and silver. No. 1,999,864. Edward A. Capillon, Attleboro, Mass., and Frederic E. Carter, Maplewood, N. J., to Baker & Co., Newark, N. J.
Production alloy containing palladium, platinum, and nickel. No. 1,999,-865. Edward A. Capillon, Attleboro, Mass., and Frederic E. Carter, Maplewood, N. J., to Baker & Co., Newark, N. J.
Production alloy consisting of palladium, platinum, silver, and a metal of the nickel group. No. 1,999,866. Edward A. Capillon, Attleboro, Mass., and Frederic E. Carter, Maplewood, N. J., to Baker & Co., Newark, N. J.
Production an alloy containing tin, aluminum, manganese, zinc or cadmium, and magnesium. No. 2,000,115. Robert T. Wood, Cleveland, O., to Magnesium Development Corp., a corporation of Delaware.
Recovery volatilizable metals by reduction of materials containing them. No. 2,000,140. Arthur Leysner, Magdeburg, Germany, to Fried. Krupp Grusonwerk Aktiengesellschaft, Magdeburg-Buckau, Germany.
Reduction of oxygeneous nickel or nickel copper compounds. No. 2,000,171. Anton Martin Gronningsaeter, New York City, to Falconbridge Nickel Mines, Ltd., Toronto, Canada.
Method working up auriferous and cupriferous arsenical pyrites. No. 2,000,183. Axel Rudolf Lindblad, Djursholm, Sweden.
Froth flotation process for oxide ores. No. 2,000,350. John Mark Patek, Milwaukee, Wis.
Process floating uranium ores, particularly carnotite, using a dilute alkali soap solution and a water-soluble lead salt during process. No. 2,000,658. Harry Howard Armstrong and Arthur Burley Menefee, Los Angeles, Cal.
Production an alkaline earth metal-aluminum-caesium alloy which yields caesium on vacuum distillation. No. 2,000,740. Dorothy Hall Brophy, Schenectady, N. Y., to General Electric Co., Schenectady, N. Y.
Recovery of metallic zinc from materials containing oxidic compounds of zinc. No. 2,000,833. Max Gerhard Freise, Angermund, near Dusseldorf, Germany, to American Lurgi Corp., New York City.
Manufacture a welding rod, consisting of a metal core having a coating comprising slip clay, iron oxide, calcium carbonate, feldspar, manganese ore, rutile, carbonaceous material, ferro-manganese, ferrochrome, and dextrin. No. 2,000,861. Wilber B. Miller, Flushing, N. Y., to Oxweld Acetylene Co., a corporation of W. Va.
Production of a double heat of ferrous alloys in an electric arc furnace. No. 2,001,015. Alex. L. Feild, Balto., Md., to Rustless Iron Corp. of America, Balto., Md.
Production iron-chromium alloys. No. 2,001,016. Alex. L. Feild, to Rustless Iron Corp. of America, Balto., Md.
Production stable chromium-nickel-iron alloy. No. 2,001,123. Vere B. Browne, Brackenridge, Pa., to Allegheny Steel Co., Brackenridge, Pa.
Manufacture metal powder. No. 2,001,134. Chas. Hardy, Pelham Manor, N. Y., to Hardy Metallurgical Co., New York City.
Electrolytic deposition of nickel from nickel salt solutions. No. 2,001,-385. Anton Martin Gronningsaeter, New York City, to Falconbridge Nickel Mines, Ltd., Toronto, Canada.
Treatment ores with sulfuric acid. No. 2,001,409. Niels C. Christensen, Salt Lake City, Utah.
Process tin plating; applying metal coating to cleaned sheet by immersing in molten bath of an alloy consisting of cadmium and tin. No. 2,001,474. Francis H. Snyder, Niagara Falls, N. Y., and Stanley F. M. Maclaren, Niagara Falls, Canada, to Industrial Research, Ltd., Niagara Falls, Canada.
Manufacture silver solder especially suitable for joining tarnish-resisting silver alloys, consisting of silver, tin, and zinc. No. 2,001,639. Harold Turner, Sheffield, England, to Johnson Matthey & Co., Ltd., London, England.
Manufacture ornamental panel of rustless steel and vitreous enamel; having coating of enamel applied to recessed parts; the stainless alloy steel body containing chromium and nickel. No. 2,001,725. Henry H. Harris, Champaign, Ill.
Manufacture coated copper article. No. 2,001,753. Robt. R. Tanner, Highland Park, and John S. Thompson, Detroit, Mich., to Metal Finishing Research Corp., Detroit, Mich.
Process coating iron or steel; immersing articles in solution containing acid phosphates and a nitrate of an alkali metal. No. 2,001,754. John S. Thompson and Van M. Darsey, to Metal Finishing Research Corp., all parties of Detroit, Mich.
Mineral separator. No. 2,001,756. Walter R. J. Woock, Auburn, Cal.
Furnace for producing purified copper, copper alloys or the like. No. 2,001,808. Maurice L. Wood, to The Chase Companies, Inc., both parties of Waterbury, Conn.

Paper and Pulp

Production varnished paper; using coating of pigment and casein, finally applying coat of varnish. No. 1,999,260. John E. Schopp, Oak Park, Ill.
Preparation composition comprising an intimately admixed dry mixture of lime, alum, and titanium oxide, final product being of plastic or pasty consistency, and being adapted for a coating material and as a filler for paper. No. 2,000,031. Leon H. Larson, Norwalk, Conn., to R. T. Vanderbilt Co., New York City.
Device and method for hydrating pulp. No. 2,000,268. Geo. S. Witham, Jr., Lincoln, N. H.
Production a waterproof abrasive paper; using abrasive material, a collodium solution, and an alcoholic rosin solution during process. No. 2,000,532. Carl Munch, Duren, Germany, to Atlas-Ago, Chemische Fabrik, Aktiengesellschaft, Molkau-bei Leipzig, Germany.
Apparatus for and method of drying a continuous traveling web of paper. No. 2,000,546. John O. Woodsome, Detroit, Mich.
Method removing resin from cellulose pulp. No. 2,000,562. Gustaf Haglund, Stockholm, Sweden, to Patentaktiebolaget Grondal Ramen, Stockholm, Sweden.
Method of incorporating calcium sulfates in manufacture of paper; dispersion containing a soluble aluminum compound and an alkaline lime compound. No. 2,001,246. Orvon P. Gephart, Miamisburg, O., to Howard D. Meincke.

Petroleum Chemicals

Production oxidized asphalt from a naphthenic base crude oil. No. 1,999,018. Earle W. Gaard and Blair G. Aldridge, Los Angeles, Cal.
Method deodorizing a hydrocarbon liquid to leave a substantially inodorous sulfur content therein. No. 1,999,041. Albert Ernest Dunstan, to Anglo-Persian Oil Co., Ltd., both of London, England.
Method increasing production of wells; using chlorine during operation. No. 1,999,146. Henry A. Ambrose and Albert G. Loomis, Pittsburgh, Pa., to Gulf Research & Development Corp., Wilmington, Del.
Process of absorbing CO and/or diolefines from gases or vapors. No. 1,999,159. Adrianus Johannes van Peski, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.
Production a cold mix and cold laid bituminous mixture, using priming oils and powdered asphalts as thickeners. No. 1,999,178. Chas. M. Baskin, Montreal, Canada, to Standard Oil Development Co., Bayway, N. J.
Agent for purification oils; consisting of a dry powdered or granular material comprising an absorbent earth and a mixture of ferric sulfate and free sulfuric acid. No. 1,999,335. Percival John McDermott, Manchester, England, to Refiners, Ltd., Manchester, England.
Preparation compound catalyst for reactions involving petroleum oils and the like; a composition consisting of aluminum chloride and a phenol. No. 1,999,345. Donald R. Stevens, Pittsburgh, and Wm. A. Gruse, Wilkinsburg, Pa., to Gulf Refining Co., Pittsburgh, Pa.
Method coking heavy fluent hydrocarbons. No. 1,999,437. Chas. W. Andrews, Chicago, Ill., and Roy S. Petersen, San Antonio, Tex., to Brassert-Tidewater Development Corp., Chicago, Ill.
Manufacture alcohols by hydrating the corresponding olefine having at least one double bond in the molecule. No. 1,999,620. Adrianus Johannes van Peski and Siegfried Leonard Langedijk, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Cal.
Process absorbing olefines, having three or more carbon atoms in the molecule, in strong acids. No. 1,999,621. Adrianus Johannes van Peski, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Cal.
Improved method drilling wells; using during operation fluid wherein mud fluid is admixed with a modicum of caustic alkali solution. No. 1,999,766. Howard C. Lawton, Albert G. Loomis, and Henry A. Ambrose, Pittsburgh, Pa., to Gulf Research & Development Corp., Pittsburgh, Pa.
Process for azeotropic drying of mixtures of water and alcohols or ketones. No. 2,000,043. Wm. H. Shiffler and Robert C. Mitthoff, Berkeley, Cal., to Standard Oil Co. of Cal., San Francisco, Cal.
Preparation mineral oil; the combination, with a mineral oil susceptible to atmospheric oxidation, of a stabilizer comprising beta naphthol and dibenzyl disulfide. No. 2,000,105. Bertrand W. Story and Everett W. Fuller, Woodbury, N. J., to Socony-Vacuum Oil Co., a corporation of N. Y.
Process recovery and separation of naphthenic acids and phenols. No. 2,000,244. David R. Merrill, Long Beach, and Arthur L. Blount, Wilmington, Cal., to Union Oil Co. of Cal., Los Angeles, Cal.
Process distilling mineral oils, tars, and still residues; commingling same with a finely powdered, oxidized, complex zincy ore, then distilling in two stages. No. 2,000,305. Alfred M. Thomsen, San Francisco, Cal.
Preparation a stabilized mineral oil containing a calcium naphthenate. No. 2,001,108. Chas. K. Parker, Richmond, Cal., to Standard Oil Co. of Cal., San Francisco, Cal.

Method treating oil and gas wells; using two chemicals and an oil during treatment. No. 2,001,350. Ronald Van Auken Mills, to Continental Oil Co., both parties of Ponca City, Okla.
Preparation an organic disulfide; reacting upon an alkyl mercaptan in caustic solution with oxygen at a pressure above atmospheric. No. 2,001,715. Herbert G. M. Fischer, Westfield, N. J., to Standard Oil Development Co., Bayway, N. J.

Pigments

Preparation pigments for use in liquid coating compositions; first step submitting pigment together with a thermoplastic resin to a grinding, shearing, rubbing, and mixing action. No. 2,000,003. Albert E. Verbyla, Elizabeth, N. J., to Standard Varnish Works, a corporation of New York.
Manufacture pigment; first step mixing ferrous hydroxide with a non-alkaline tannin extract derived from chestnut wood. No. 2,000,050. Charles A. Thomas and Carroll A. Hochwalt, Dayton, O., to Mead Research Engineering Co., Chillicothe, O.
Preparation green pigments; heating an alkaline-earth metal chromate to a temperature of 700-1300°C, in an atmosphere containing SOy, y standing for 2 or 3. No. 2,000,135. Friedrich August Henglein, Cologne-Deutz, and Oswin Nitzschke, Leverkusen-I. G. Werk, Germany, to I. G., Frankfort-am-Main, Germany.
Manufacture basic lead pigments from lead ores in which the lead is recovered from the ores in a chloride brine. No. 2,000,661. Niels G. Christensen, Salt Lake City, Utah.
Manufacture pigment; using ferrous hydroxide, a non-alkaline tannin extract derived from chestnut wood, and film forming oil during process. No. 2,000,842. Carroll A. Hochwalt, Dayton, O., to Mead Research Engineering Co., Dayton, O.

Resins, Plastics, etc.

Production heat convertible resin involving the reaction of shellac, a dibasic organic acid, a polyglycol, and glycerol. No. 1,999,096. Arthur Haroldson, Valparaiso, Ind., to Continental Diamond Fibre Co., Newark, Del.
Production fusible soluble resins. No. 1,999,093. Alphonse Gams and Karl Frey, Basel, Switzerland, to Ciba Products Corp., Dover, Del.
Preparation tough, flexible resinous product, involving reaction of a dibasic organic acid and polyglycol, and a natural resin. No. 1,999,097. Arthur Haroldson, Valparaiso, Ind., to Continental Diamond Fibre Co., Newark, Del.
Manufacturing a block from artificial resin. No. 19,549. Reissue. Lawrence C. Byck, Elizabeth, and Gilbert L. Peakes, Metuchen, N. J., to Bakelite Corp., New York City.
Plastic composition suitable for luting; consisting of beeswax, spar varnish, a hardening wax, and an inert filler No. 1,999,175. Emil C. Johnson, Falconer, N. Y.
Production a water soluble resinous product; mixing and heating a hexose with an anhydride of a dicarboxylic organic acid. No. 1,999,380. John Morris Weiss, New York City, to Weiss & Downs, Inc., New York City.
Manufacture a laminated panel. No. 1,999,384. Herbert J. Woodall, Detroit, Mich., to Woodall Industries, Inc., Detroit, Mich.
Method controlling characteristics of a resorcinol-formaldehyde resin. No. 1,999,716. Horace P. Billings, Merchantville, and Dee A. Hurst, Haddonfield, N. J., to Radio Corp. of America, a corporation of Delaware.
Method rendering a synthetic curing resin plastic; incorporating a raw fatty oil, a blown drying oil, and the fatty acid of an oil during the early stages of resin formation. No. 1,999,717. Horace P. Billings, Merchantville, and Dee A. Hurst, Haddonfield, N. J., to Radio Corp. of America, a corporation of Delaware.
Manufacture panel from thermoplastic fibrous sheet material. No. 1,999,796. Paul R. Zinser, Detroit, Mich., to Woodall Industries, Inc., Detroit, Mich.
Production dull artificial straw; using a plastic material and a volatile liquid during process. No. 2,000,013. Camille Dreyfus, New York City, and Wm. Whitehead, Cumberland, Md., to Celanese Corp. of America, a corporation of Delaware.
Production resinous complex, consisting of reaction products of Congo resin, ordinary rosin, phthalic anhydride, and glycerol. No. 2,000,937. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., Montclair, N. J.
Manufacture a plastic composition, characterized by being sufficiently workable in the plastic state to permit production of molded, extruded and similar products. No. 2,001,311. Morris Osmansky, Boston, Mass., to E. W. Colledge, General Sales Agent, Inc., Jacksonville, Fla.
Manufacture a carbohydrate phenol resin. No. 2,001,430. Jos. V. Meigs, Hastings-on-Hudson, N. Y., to Plastix Corp., Wilmington, Del.
Apparatus for manufacturing hollow articles from plastic materials. No. 2,001,765. Kurt Bratring, Berlin-Charlottenberg, Germany.

Rubber

Manufacture a dipped rubber article having a wrinkled surface. No. 1,999,024. Sherman I. Strickhouser, Providence, R. I., to U. S. Rubber Co., New York City.
Production chemical compounds comprising peracylated rubber and a film forming material. No. 1,990,186. Robert Barnett Flint, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.
Preservation rubber, by treatment with the condensation product of an unsaturated aliphatic ketone with a primary aromatic amine. No. 2,000,039. Waldo L. Semon, Cuyahoga Falls, and Arthur W. Sloan, Akron, O., to B. F. Goodrich Co., New York City.
Rubber composition and method of preserving rubber. No. 2,000,040. Waldo L. Semon, Silver Lake Village, and Arthur W. Sloan, Akron, O., to B. F. Goodrich Co., New York City.
Preservation rubber by treatment with reaction product of a ketone containing not more than 2 oxygen atoms with an aromatic amine. No. 2,000,041. Waldo L. Semon, Silver Lake Village, and Arthur W. Sloan, Akron, O., to B. F. Goodrich Co., New York City.
Method retarding deterioration of rubber; treating rubber with a polyaryl carbinol containing at least one not more than 2 amino groups. No. 2,000,044. Arthur W. Sloan, Akron, O., to B. F. Goodrich Co., New York City.
Method preserving rubber. No. 2,000,045. Arthur W. Sloan, Akron, O., to B. F. Goodrich Co., New York City.
Manufacture a felted asbestos product; consisting of a base fabric of asbestos coated with a plastic binder. No. 2,000,416. Wm. D. Pardoe, Lawrenceville, N. J., to Thermoid Rubber Co., Trenton, N. J.
Method preserving rubber, by treatment with reaction product of one molecular proportion of acetone-anil and one atomic weight portion of sulfur. No. 2,001,071. Robert L. Sibley, Nitro, W. Va., to Rubber Service Labs. Co., Akron, O.
Manufacture from rubber latex of rubber articles carrying imprints. No. 2,001,125. James Baret Crockett, Cambridge, Mass.
Rubber composition; comprising rubber and a coal tar distillate derived from low temperature tar. No. 2,001,176. Frank H. Bergeim, Leonia, N. J., to The Barrett Co., New York City.
Preparation a stable concentrater latex composition, capable of producing a dried rubber film, free of water-soluble ingredients; comprising a creamed latex containing a soap of a volatile base, a soap-forming acid, and a volatile resin solvent. No. 2,001,791. Chester E. Linscott, Saugus, Mass., to U. S. Rubber Co., New York City.

Textile, Rayon

Apparatus for wet treatment of textile goods. No. 1,999,317. Hans Brix, Rheydt, Germany.
Manufacture artificial silk by dry spinning method. No. 2,000,047. Herbert G. Stone, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.
Manufacture artificial silk by dry spinning method. No. 2,000,048. Herbert G. Stone, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.
Preparation a wetting and penetrating composition for use in mercerizing processes; a homogeneous mixture of pine oil, phenols, and higher fatty acids. No. 2,000,559. Chas. Dunbar, Middleton, and Wm. Todd, Manchester, England, to Imperial Chemical Industries, Ltd., London, England.
Manufacture an artificial silk filament of diminished lustre, having submerged in and distributed throughout its mass material fine particles of preformed zirconium oxide nearly white in color. No. 2,000,671. Jas. A. Singmaster, Bronxville, N. Y.
Preparation a viscose solution containing a dithiocarbonic acid starch ester. No. 2,000,887. Richard Elssner, Elizabethton, Tenn., to North American Rayon Corp., a corporation of New York.
Production a wetting-out emulsifying agent resembling Turkey red oil; consisting of mixture of sulfates and sulfonates of naphthenic alcohol. No. 2,000,994. Walter Schrauth, Berlin, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

Water, Sewage Treatment

Activated sludge process of sewage treatment. No. 1,999,058. Wm. Raisch, Forest Hills, N. Y., to Municipal Sanitary Service Corp., a corporation of N. Y.
Process mercerizing cellulose pulp in bulk form. No. 1,999,059. Geo. A. Richter, Berlin, N. H., to Brown Co., Berlin, N. H.
Method water treatment; using copper sulfate, lime, sodium carbonate, and mono-sodium phosphate. No. 2,000,197. Robert M. Smith, Youngstown, O.
Apparatus for purification of sewage and other liquids. No. 19,577. Reissue. Walter Jones, deceased, late of Stourbridge, England, by Activated Sludge, Inc., Chicago, Ill.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Buying. "Reciprocity," by C. B. Larrabee. Discusses a subject that is front page news at the moment in practically every field including the chemical. *Printers' Ink*, May 16, p7.
Chemical Economics. "The Chemical Revolution," by Williams Haynes. *The Economic Forum*, Spring issue, p47.
Chemical Specialties. "Trade-Mark Menace," by Harry D. Nims and Stewart L. Whitman. A discussion of several vicious state trade-mark bills now before various legislatures. *Printers' Ink*, May 16, p16.
Chemical Specialties. "We Select a Label Color," by C. H. Frankenburg, sales manager of the Savogran Co. Tells how a manufacturer made a choice of colors for packaging a new product. *Printers' Ink Monthly*, June, p36.
Chemical Specialties. "Counterfeit," by C. B. Larrabee. An answer to the latest book from the pen of Mr. Kallet and his co-workers of Consumers' Research, Inc. Mr. Kallet's first book, it will be recalled, was "One-Hundred Million Guinea Pigs." *Printers' Ink*, June 6, p.29.
Coatings. "New Trends in Automotive Finishing," by E. W. Windsor, Sherwin-Williams. A practical discussion of the new baked synthetic finish as practiced at the Ford plant. *Industrial Finishing*, June, p16.
Color. "Color: Its Character, Perception, Measurement and Reproduction," by Robert E. Rose, du Pont. Speech delivered before the R. I. Section of the A. A. T. C. & C. *American Dyestuff Reporter*, June 17, p334.
Detergents. "Germicidal Detergents," by H. O. Halvorson, Milward Bayliss, Erling J. Ordel, and John L. Wilson. *Soap*, May, p25.
Europe. "A Chemical Engineer's Impressions of Europe in 1935," by Albert E. Marshall. *Chemical and Metallurgical Engineering*, May, p244.
Fats and Oils. "Rancidity in Fats and Fatty Oils," by H. M. Langton. *The Industrial Chemist Supplement*, British, March, p2.
Financial. "Analyzing The Chemicals," by Howard Florance. A discussion of the financial background, earnings, etc., of the leading chemical companies. *Review of Reviews*, May, p53.
Historical. The May 4th issue of Chemical Age, British, contained a series of articles dealing with the progress in the last 25 years made in British chemical manufacture and chemical equipment. Was issued in connection with the 25th anniversary of the Present King's coronation.
Industrial Chemicals. "Modern Trends in Sulfuric Acid Manufacture," by W. A. Damon. *The Industrial Chemist*, British, March, p95.
Leather. "Twenty-five Years of Research in Leather Science," by Dr. Dorothy Jordan Lloyd. *The Leather Trades' Review*, British, May, p549.
Metallurgical. "Use of Inhibitors in Preventing Corrosion by Acids, Part 1," by V. A. Wardell. *Chemical Engineering Mining Review*, Australia.
Miscellaneous. "The Saponins, Part 1," by G. Middleton. *The Industrial Chemist Pharmaceutical and Cosmetic Supplement*, British May, p37.
Oils and Fats. "Rancidity of Oils and Fats," by C. C. Price. *Canadian Chemistry and Metallurgy*, May, p134.
Paints. "Synthetic Resins for Printing Inks," by John McE. Sanderson of American Cyanamid & Chemical Corp. *Paint, Oil and Chemical Review*, June 13, p22.

Chemical Markets & News

Important Alkali Freight Rate Changes in Official Classification Territory—M. C. A. Opposes Wagner Labor Disputes Bill—American Petroleum Institute Clashes With the Farm Chemurgic Council Over Alcohol-Gasoline Blends — Noyes To Be Honored At San Francisco A. C. S. Meeting—

The Alkali freight rate structure in Official Classification territory is of major importance because nearly 60% of the commercial alkali tonnage is transported within that area, which embraces, roughly, the U. S., east of the Mississippi River along the Illinois State line and north of the Ohio-Potomac Rivers, plus the greater part of Virginia.

Since 1931, when the Eastern Class Rate decision of the Interstate Commerce Commission made it apparent that these railroads would have to revise the old-standing alkali commodity rate structure to recognize more nearly the principle of relative geographical location, in compliance with the Fourth Section of the Act, the Alkali Traffic Association has had this revision under discussion with the railroads interested, together with alkali consumers.

At a Buffalo hearing, June 21, consumers and producers criticized the carriers' proposal as being unreasonable, and Harry M. Mabey, speaking as chairman of the Alkali Traffic Association, urged that the new rates should be no higher than the long-standing base rates to the primary alkali consuming points, and suggested the basis which, substantially, the railroads finally approved, to become effective Sept. 1, '35, about 10% lower than that proposed by these carriers. This will, effective Sept. 1, 1935, instead of the existing point-to-point commodity rates, result in a uniform level of rates to, from and between practically every station in Official Classification territory, related in terms of railroad distance, applicable on soda ash, modified sodas, caustic soda and bicarbonate of soda, in bulk or in the usual packages, in carloads of a minimum weight of 45,000 lbs.; also on liquid caustic, in tank cars, rates about 12% lower than on the dry alkalies.

Corrects Maladjustments

As compared with existing rates, the new rates will be nearly the same as those now prevailing east of the Buffalo-Pittsburgh line; west thereof a maladjustment which has prevailed since 1931 will be corrected and the rates reduced, on the average, about 20¢ per ton; New England will benefit even more by being given the same basis as the rest of official territory.

Chemical Leaders at Skytop

Two hundred of the nation's outstanding chemical leaders attending the 63rd annual meeting of the M. C. A., held at Skytop Lodge in the Pocono Mountains June 6-8, were emphatic in their opposition to the passage of the Wagner labor disputes bill, were insistent that reformation of the Federal Reserve System be deferred until more thorough study of the country's banking needs could be made, and for the 2nd time in the history of the Chemical Alliance gave to that body a stand-by status. The Association went on record as favoring the continuance of the industry's favorable wage and hours reputation.

President Bell devoted most of his informal talk to a discussion of the effect on business of the various bills before Congress. Chairman Belknap, chairman of the executive committee, reported on the association's work in the past year, particularly on the carbon tetrachloride, carbon bisulfide, aniline and benzol agreements with the Public Health Service over satisfactory labels; on the excellent work of the container committee; on the valuable work done on the code; and on the close watch maintained on unfavorable federal and state legislation. He commended Secretary Watson for his painstaking work during the year.

Collectivism vs. Individualism

Former Director of the U. S. Budget, Lewis Douglas, now a Cyanamid director and vice-president, told the chemical leaders that the country is faced with the choice between collectivism and individualism. Neil Carothers, noted Lehigh economist, picked a number of serious and dangerous flaws in the proposed banking bill. August Merz, president of the S. O. C. M. A., acted as toastmaster at the union dinner held by the 2 organizations.

All officers of the M. C. A. were reelected for another term following the report of the nominating committee which was headed by Leonard T. Beale of Penn. Salt.

Chemurgic Organized

The Farm Chemurgic Council organized at the Union League Club, Chicago, on June 12, elected as its first president, Francis P. Garvan, president of the Chemical Foundation. Organization of this new body was authorized by the Dearborn Joint Conference of Agriculture, Industry and Science, held in Dearborn, Mich., May 7 and 8. An organizing committee of 15 members of the conference was named by Chairman Garvan of the conference. It met at the Union League Club for permanent organization to effectuate the purpose of the conference—to bring about the active cooperation of agriculture, industry and science in the solution of farm problems.

Other officers elected were 3 section vice-presidents—Wheeler McMillen, editor, *Country Home*, agriculture; Dr. Roger Adams, president A. C. S., science; Howard E. Coffin, chairman Board of South-

COMING EVENTS

International Agricultural-Chemical Congress, Brussels, Belgium, July 15-28.
Salesmen's Association, 2d Golf Tournament, Lakeville Country Club, L. I., July 16.
American Pharmaceutical Association, Portland, Ore., Aug. 5-10.
Agricultural Insecticide and Fungicide Association, Lake Shore Hotel, Cleveland, Aug. 7.
A. C. S., 90th Meeting, San Francisco, week of Aug. 19.
Central States Section, American Water Works Association, Fort Pitt Hotel, Pittsburgh, Aug. 22-23.
Technical Association of the Pulp & Paper Industry, fall meeting, Atlantic City, week of Sept. 16.
New England Water Works Association, Providence-Biltmore Hotel, Providence, Sept. 17-20.
Atlantic Coast Premium Exposition, Hotel Pennsylvania, N. Y. City, Sept. 23-27.
Electrochemical Society, semi-annual meeting, Washington, D. C., Hotel Willard, Oct. 10-12.
24th National Safety Council, Louisville, Oct. 14-18.
American Gas Association, Palmer House, Chicago, Oct. 14-18.
Laundryowners' National Association, Hotel Traymore, Atlantic City, Oct. 21-24.
Second Annual Convention, National Paint, Varnish and Lacquer Association, Mayflower Hotel, Washington, Oct. 30-Nov. 1.
In connection with the convention the "Paint Show" will be held Oct. 27-29 at Washington.
13th Midwest Regional A. C. S. Meeting, Brown Hotel, Louisville, Oct. 31-Nov. 2.
American Petroleum Institute, Biltmore Hotel, Los Angeles, Nov. 11-14.
American Institute of Chemical Engineers, Columbus, Ohio, Nov. 13-15.
International Acetylene Association, Hotel Cleveland, Nov. 12-15.
Working Association for Combating & Preventing Corrosion, Berlin, Nov. 18-19.
Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 2-7.
Sixth National Organic Chemistry Symposium, Rochester, N. Y., Dec. 30.
Chemical Engineering Congress, Central Hall, Westminster, England, June 23-27, 1936.

east Cottons, Inc., industry—Dr. Harry E. Barnard, director of research; William W. Buffum, treasurer, Chemical Foundation, treasurer; Carl B. Fritsche, managing director, and C. V. Gregory, editor, *Prairie Farmer*, secretary.

Disputes Alcohol Fuel Value

Bitter is likely to be the dispute between the Farm Chemurgic Council and the American Petroleum Institute over the subject of use of alcohol in gasoline for fuel purposes. The A. P. I. recently challenged the Chemical Foundation to contribute in a joint investigation of alcohol-gasoline blends, suggesting a maximum total of $30,000.

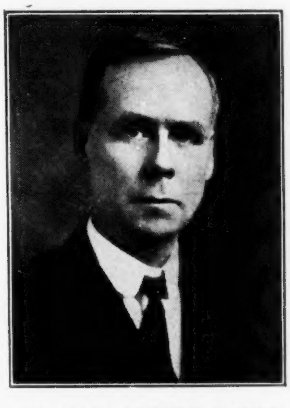
Mr. Garvan, in refusing, stated that his organization considered blends already had been proven superior and then countered with the following:

"If you will amend your proposal to a proposal for an investigation of whether an alcohol blend of gasoline is of a higher interest and benefit to the 120,000,000 people of the U. S. than a gasoline fuel without alcohol, the Chemical Foundation will gladly join you to the extent of $15,-000 or more for an impartial body to determine that question."

Associations

¶ A. C. S. Goes to the Coast for August Meeting — Leather Chemists Hold Successful Skytop Convention—Golf in the Metropolitan Area—Lynn and Salem Chemists to Organize—

Rise of the chemical industry on the Pacific Coast will be featured at the 90th meeting of the A. C. S., which will be held in San Francisco, Aug. 19 to 23. Chemists from all over the country will participate. Petroleum, wine-making, vitamins, and new uses for wood will be special fields of discussion.



WILLIAM ALBERT NOYES
"for distinguished service to chemistry." Illinois' beloved chemist is a Priestley Medalist.

Sessions will be devoted to other fields of chemistry, including cellulose, colloids, gas and fuel, chemical education, paint and varnish, sugar, and physical and inorganic chemistry. Presidential address will be delivered by Prof. Roger Adams of the University of Illinois, president of the Society.

William Albert Noyes, emeritus director of the laboratories of the University of Illinois, will receive the Priestley Medal, highest honor of the A. C. S., which is bestowed every 3 years "for distinguished service to chemistry." The A. C. S. Award in Pure Chemistry of $1,000 will be presented to Dr. Raymond M. Fuoss of Brown University. Dr. Noyes is 78 years old. Dr. Fuoss is 29.

Leather Chemists Hear Katz

With an attendance of over 130 the June meeting of the leather chemists at Skytop was pronounced a huge success by all those present. Dr. Fred O'Flaherty, president of the American Leather Chemists' Association and head of the Tanners' Council's research laboratory, spoke on the importance of research in leather and tanning fields. Prof. J. R. Katz of Amsterdam was the guest speaker. Percival Foerderer, well-known tanner and chairman of the Tanners' Council, pleaded for a broader application of research in industry. Technical discussions took up the rest of the 3 day period. R. E. Porter, National Oil Products, and L. M. Whitmore, Leas-McVitty Co., Salem, Va., are new members of the ordinary council.

Chemists' Club & Salesmen's Golf

Mathieson's "Bob" Quinn, as chairman of the Chemists' Club golf committee, handed out prizes at the Upper Montclair Country Club, Upper Montclair, N. J., on June 27 to the following winners: William Callan, Casein Manufacturing, Carleton Ellis trophy; second low net, A. M. Taylor; low gross, H. J. Hemingway, of R-B-H Lacquer Base; second low gross, A. B. Baker, Bradley & Baker; kicker's handicap, "Ed" Orem, duPont; booby prize, Henry H. Stiller, Advance Solvents & Chemical. A. Getterall won low net among the guests, and N. A. Burgess won the low gross prize, with the kicker's handicap award going to "Fred" Neuberg, Warner Chemical.

Earlier in the month the chemical salesmen attempted to stage the first of 4 scheduled tournaments at the swanky Baltusrol Club at Short Hills, N. J., but with the majority of the salesmen equipped with only golf sticks and lacking fishing poles nearly all were forced in-doors and to amusements usually played in-doors.

Nevertheless, some of the more hardy ones (undoubtedly those who diligently search for orders rain or shine) did manage to get around 18 holes and winners were declared to be Bruce Puffer, American Commercial Alcohol in the class A flight, "Vic" E. Williams, Monsanto, runner-up and Walter Merrill, Joseph Turner & Co., third. Class B prize was taken by William S. Auchincloss, *Oil, Paint and Drug Reporter*. Oscar Lind, Dow Chemical, was second and Ira P. MacNair of *Soap* was third. Kickers handicap was won by A. Heffler, a guest, and other prizes were won by Charles Kelly, Haggerty Brothers, and Arthur Rowe, Merck. E. W. Haley, Columbia Alkali, won the prize for the least putts.

Later Tournaments

The weather man has been put on his honor to do better by the Association on July 16 when the very interesting and exclusive course of the Lakeville Country Club, Great Neck, L. I., will be invaded. Other dates are August 13 at Wingfoot in Westchester, and Sept. 17 at Pomonok, Flushing.

The latest to apply for membership are J. W. Dobson of George Chemical, and J. T. Brady, representing Wilson Laboratories.

Association Notes

Prominent Lynn, Mass., chemists are discussing formation of a chemical club. Salem, which consumes more chemicals than coal, oil or gas, is also likely to be the center for a Greater Salem Chemical Club.

More extensive adoption of uniform cost accounting methods was urged by John Moran, cost accountant, of the National Fertilizer Association, in an address before the 16th International Cost Conference of the National Association of Cost Accountants.

Foreign

¶ Canada's Industry in '34 Reviewed — Number of German Chemical Workers Rises—Italy Plans Greater Use of Alcohol-Gasoline Blends—New Acetylene Competition—Foreign Notes—

Canada's chemical industry continued in '34 the expansion registered in the preceding year, preliminary figures issued by the Canadian Department of Trade and Commerce show an output of chemicals and allied products was valued at $105,-568,000, an increase of approximately 14% over '33.

Output of acids, alkalies and salts increased 28% to $16,286,000, although there was no increase in the number of plants. A new alkali plant constructed during the year did not commence operation until the beginning of '35. Fertilizer production advanced 26% to $5,399,000; explosives, 23% to $9,038,000; and paints, pigments and varnishes, 17% to $17,435,000.

Number of plants increased from 696 in '33 to 712 in '34; capital employed advanced from $153,901,000 to $155,600,000; average number of employees from 15,397 to 16,751; and the amount paid in wages increased from $18,739,000 to $20,764,000. Calcium chloride, trisodium phosphate,

electrolytic hydrogen peroxide, and sulfur were among the chemicals manufactured in '34 for the first time.

Notwithstanding the growth of Canada's chemical industry imports of chemicals and allied products into the Dominion increased from $24,068,000 in '33 to $28-149,500 for '34. U. S. is the chief source of Canada's chemical imports, supplying more than half the total, followed in importance by the U. K. U. S. imports were valued at $16,575,000, or 59% of the total, compared with $13,692,750 during the preceding year, or 57% of the total.

Management Congress Meets

The 6th International Congress for Scientific Management, to be held in London from July 15 to 20, will be opened by the Prince of Wales. This is the first time that the Congress has been held in Great Britain. It will discuss papers illustrating the best management practice in all parts of the world, and references to actual technique will relate to specific problems and how they have been met. A paper by a director of Imperial Chemical Industries, Ltd., will describe the methods adopted in the management of that undertaking.

German Nitrate May Be Higher

An advance in German nitrate prices is now under consideration, according to British *Chemical Age*. When German nitrate prices were cut on Feb. 1, '35, by 7%, in order to stimulate domestic consumption, it was agreed that the original prices should again come into force on July 1 next, unless the domestic consumption for the year ended June 30, '35, had increased to about 500,000 metric tons of pure nitrate. This total, it is understood, will not be reached.

German Social Insurance

German chemical workers (full-time) covered by social insurance increased by 16% in '34. Total of insured full time workers on Dec. 31, '34, numbered 378,579 compared with 326,967 at the end of '33, and salaries and wages paid increased from 696,958,500 to 810,735,500 marks. Of the total insured workers employed at the end of '34, full time plant workers numbered 324,566, with the balance doing office and sales work. Average wage for full time plant workers advanced 29 marks in '34 to a total of 2,104 marks but the salary level of office and sales forces declined to 2,383 marks compared with 2,483 marks for '33, continuing trend in progress since '29.

More Alcohol, Less Gasoline

Supplying less than 3% of its gasoline requirements from purely domestic sources, Italy has long sought a satisfactory substitute. Although Italy has legislation requiring gasoline dealers to absorb certain quantities of domestic alcohol, volume consumed so far has been relatively small, owing to the scarcity of properly dehydrated alcohol and the lack of effective enforcement.

The Beet and Sugar Corp. has submitted a plan to the Central Corporative Committee to increase the production of alcohol for use in motors.

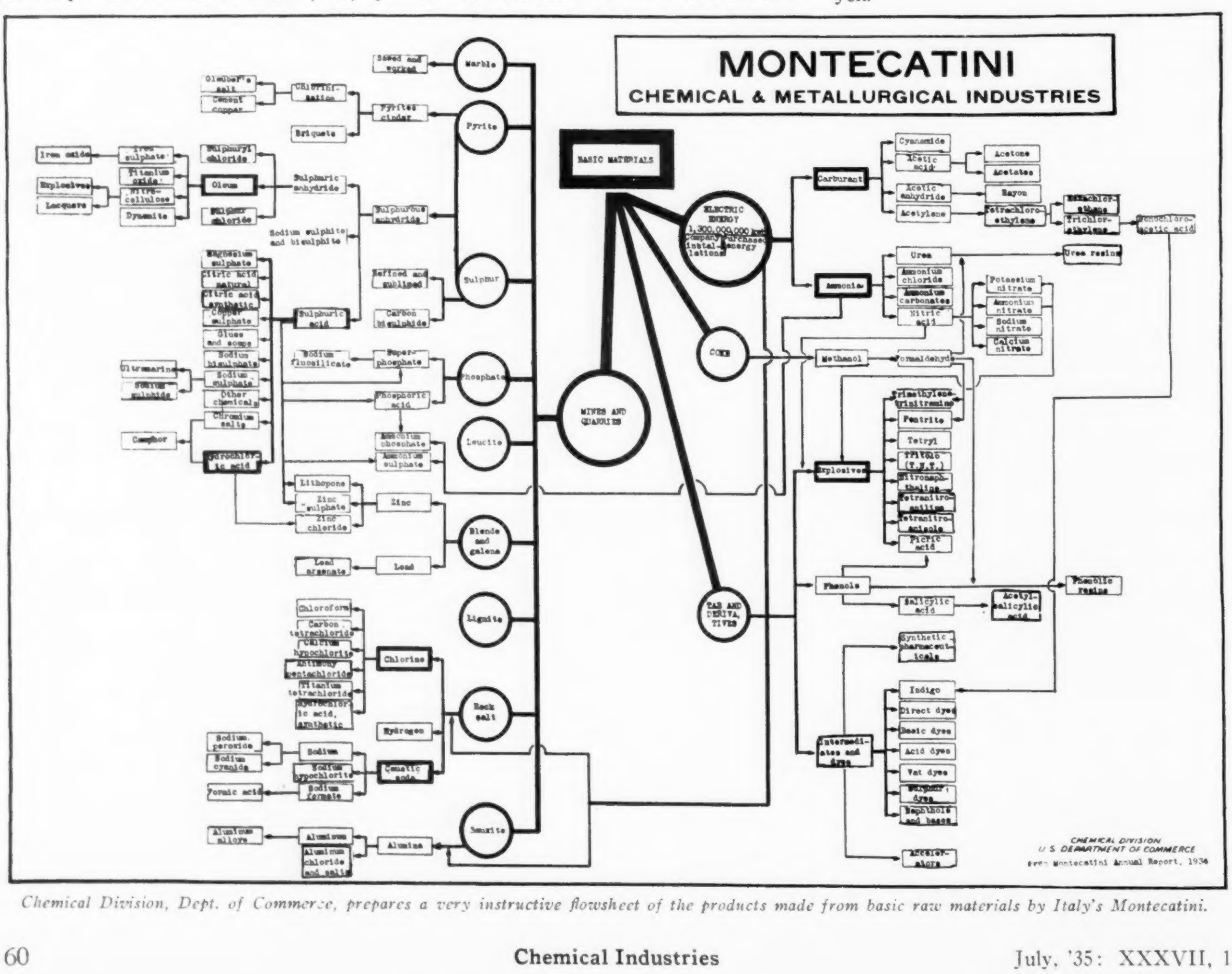
According to the plan, production would be increased to 26,500,000 gals. within 4 years. Plan also proposes that it shall be made obligatory for producers and importers of motor fuels to use sufficient alcohol mixed with gasoline to absorb the increased production, the proportion used to be fixed by law.

International Acetylene Competition

The International Carbide Syndicate in Geneva is promoting a 2nd international competition with the object of finding new and extended uses for calcium carbide and acetylene, particularly in regard to oxy-acetylene welding. Production of chemical products from acetylene is excluded from the scope of the competition. Entries will be received until Mar. 1, 1936, and results will be made known at the end of June, next year. Particulars are obtainable from the offices of "L'Acetylène et Soudure Autogene," 32, Boulevard de la Chappelle, Paris 18.

Japanese Developments

Citric acid from starch to be started in September by Yukisan Kogyo K. K., recently founded with a capital of 500,000 yen.



Chemical Division, Dept. of Commerce, prepares a very instructive flowsheet of the products made from basic raw materials by Italy's Montecatini.

Dai-Nippon Celluloid K.K. will produce synthetic acetic and cellulose acetate.

Sodium and potassium bichromates are now being made by Nippon Seiren K.K. in monthly outputs of 500 and 200 tons respectively. This firm has also increased its chromium oxide output to 15 tons per month, according to the Japanese correspondent of the British *Chemical Age*.

Dai-Nippon Fertilizer is considering formic and oxalic production. Nippon Denki Kogyo K.K. is reported as likely to enter into sodium cyanide production. Lithium and lithium salts may be made from mica by the Nippon Denki Kogyo also. A new company, Nippon Shashin Yakukin K.K., will make photographic chemicals, including hydroquinone. Soda ash and caustic, also methanol will be manufactured in the near future by Sumitomo Kayaku K.K.

Foreign Notes

Benguet Consolidated in the Philippines is developing the chromite properties of the Consolidated Mines at Masinloc and a large body of ore has been discovered. Full extent of this ore body and its chromite content is now being determined.

The Caja de Credito Minero, Santiago, is now building a sulfur refinery in the north of Chile.

Commercial Solvents' new British factory will be in the disused plant of Lever Bros. at Bromborough, according to *Synthetic & Applied Finishes.*

Swedish chemical industry had an active and prosperous year in '34.

During the past year Kuhlmann increased considerably the output of artificial resins and other plastic products.

Companhia Nitro Chimica Brasileria will make nitrocellulose rayon in Brazil with equipment from Tubize's former Hopewell, Va. plant. Tubize receives cash and 40% stock interest.

A German whaling fleet will operate in the Antarctic. New company will have headquarters at Wesersmunde and a floating factory capacity of 20,000 tons.

Kenya pyrethrum planters have determined on additional acreage in an effort to oust Japan as the premier world supplier. Latter exports 6,000 tons annually, mostly to the U. S.

The Soviet plans 2 additional nitrogen fixation plants. Synthetic coumarin will be produced commercially in the near future.

Synthetics On The *Normandie*

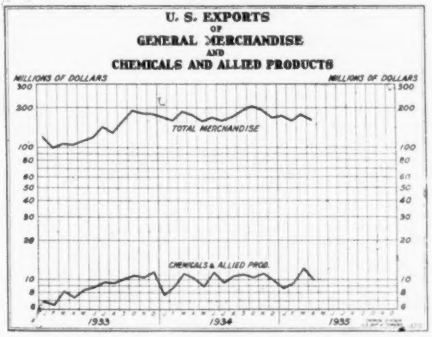
Growing importance of chemical and synthetic products in certain phases of decoration is interestingly shown in the work done on the *Normandie*. Dulux, the du Pont finish material, has been used for the painting of bathrooms and lavatories. Fabrikoid, another du Pont product, has been used to upholster the furniture in the officers' quarters and for chairs in other parts of the ship.

Rayon is found in many places and a very fine viscose rayon, manufactured by J. Colcombet, has been used for the upholstery in the smoke room. A fabric of slit cellulose film has also been used for glass curtains in the smoke room.

Foreign Trade

¶U. S. Exports, While Declining, Hold at High Levels — British Trade Gains of '34 are Continued in '35—German Export Trade Analyzed—

U. S. exports of chemicals and allied products continued at high levels in April reaching the value of $9,903,000, a slight decline from April last year but an increase of almost 35% over April, '33, according to C. C. Concannon, Chief of the Chemical Division, Bureau of Foreign and Domestic Commerce.



April exports brought the total for chemicals and allied products to $40,750,000 for the first 4 months of the year—a value increase of 7½% over the corresponding period of '34 and 42% higher than during the first 4 months of '33.

Exports of industrial chemicals, which include acids, alkalies, alcohols, cellulose solutions, and the like, increased 15½% to $2,014,000 in April compared with April last year, preliminary statistics reveal, while industrial chemical specialties advanced 7½% to $975,660.

Naval stores, gums, and resin export shipments advanced only slightly to $1,105,600 in April, compared with the same month last year. In this classification rosin shipments increased 11% to 83,940 lbs. and the value advanced 4% to $699,000. Exports of turpentine were lower in both quantity and value than for April, '34.

While the total of coal-tar products declined 8½% in April to a value of $1,094,500, due to a marked decline in benzol shipments, exports of coal-tar dyes, colors, stains and color lakes increased 21% in quantity to 1,592,500 lbs. and the value, compared with April last year was up from $377,000 to $543,750.

Notwithstanding a substantial increase in phosphate fertilizer exports in April the total of fertilizer materials declined 40% in value to $741,400 compared with April last year, due to a marked decline in certain classes of nitrogenous chemical fertilizer materials.

Sulfur Exports Decline

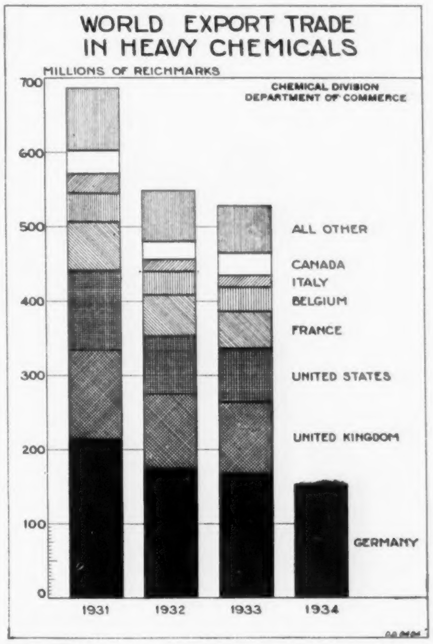
Other chemicals and allied products exports registering increases in April included essential oils, medicinals and pharmaceuticals, and soaps and toilet preparations. Declines were recorded in export shipments of crude sulfur, industrial explosives, printing ink, and unfabricated pyroxylin materials.*

British '35 Trade

Foreign trade gains made by the British chemical industry in '34 have been well maintained during the current year. Exports of British chemicals and allied products during the first 4 months of '35 were valued at $39,000,000, an increase of 5% over the corresponding months of the preceding year, and 14% above the first 4 months of '33.

Imports, however, during the first 4 months declined 8% to a total value of $31,600,000, compared with the '34 period, but were 27% higher than for the first 4 months of '33.

Decline in total chemical and allied product imports was due largely to smaller receipts of Indian shellac. Import items showing advances over the first 4 months of '34 included potash, sodium nitrate, and phosphate rock fertilizers and sulfur.



British domestic production of chemicals was approximately 5% greater during the first quarter of '35, than for the first 3 months of the preceding year, according to the index of the British Board of Trade.

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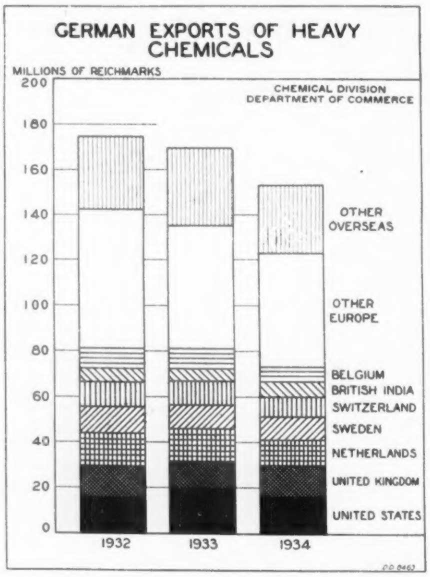
* May exports reached $11,171,000, reversing the recent downward trend, all major items except sulfur and certain coal tar crudes registering impressive gains.

German '34 Exports Decline

Heavy chemicals, as classed in German statistical schedules, appear as one of the important classes among Germany's chemical exports, accounting in recent years for approximately one-fourth of the country's total chemical export trade.



Despite exchange handicaps, German chemical export business held up remarkably well in '34 with the U. S. the best customer.

Until '34 Germany's heavy chemical exports held up better than its chemical export trade as a whole, notwithstanding the growing production of these products in countries formerly served by imports. Total exports of heavy chemicals from Germany in '34 reached the value of 153,000,000 marks, a decline of approximately 10% from the preceding year, and compares with 251,000,000 for '30.

Wide Distribution

German heavy chemicals are widely distributed in world markets, the report reveals. Among individual countries the U. S. was the largest purchaser in '34, taking a variety of products valued at a total of 16,300,000 marks. The United Kingdom was 2nd, with 13,400,000 marks and was followed by The Netherlands with 11,200,000; Sweden, 10,200,000; Switzerland, 8,800,000; British India, 6,700,000; and Belgium, 6,400,000 marks.

World's Leading Exporter

Germany is by far the world's leading exporter of heavy chemicals, accounting for approximately one-third of the total international trade in these products which in '33 amounted to 528,000,000 marks, according to a German compilation. Of this total, exports from Germany amounted in value to 169,000,000 marks; United Kingdom, 95,000,000; U. S., 73,000,000; France, 50,000,000; Belgium, 32,000,000; Canada, 30,000,000; and Italy, 15,000,000 marks.

So, despite serious handicaps, the German industrial chemical division has done remarkably well.

Customs and Tariffs

¶U. S. Customs Court Passes On Dye Standards—Treasury Issues Ruling On Copper Sulfide Concentrates—Canadian Totals For Antimony Oxide—

In view of the identical provisions in Paragraphs 27 and 28 of the Tariff of 1922 and the Tariff of 1930 for a finding by the Secretary of the Treasury with respect to the commercial strength of a coal-tar dye, in accordance with which specific duty is assessed upon more than the actual weight, the Customs Court has held that a standard for a particular dye promulgated under the previous law is applicable to importance under the tariff now in force. Ruling upholds the practice followed by the collector at N. Y. City port against which protest was lodged by the Ciba Co.

Copper sulfide concentrates which have been roasted for oxidation and partial elimination of the sulfur content should come in free of duty under paragraph 1658 of the 1930 tariff act and should be subject to the import tax of 4¢ per lb. on the copper content under section 601 (c) (7) of the 1932 revenue act, the Treasury Department ruled on June 25.

Chance For Foreign Producers

The Canadian Department of National Revenue has reduced the requirement regarding the British content of antimony oxide admitted to Canada under the British preferential tariff from one-half to one-quarter, as from May 11.

Companies

¶ Great Western's 5-to-1 Split-up—Penn. Salt & Lindsay Chemical Have Group Insurance Plans —U. S. Rubber Urges Protest—Disastrous Series of Fires — Other Notes—

A five-to-one split-up of common and preferred stocks of Great Western Electro-Chemical is approved by directors of the organization. A special meeting of stockholders has been called for July 16, to vote on an amendment to the articles of incorporation to provide for such a change in capitalization.

Request for the split-up was made by a number of stockholders because of the high price at which the stock is now selling. At present the common is selling around $210 a share, while the preferred is selling around $100.

Under the change Great Western would have outstanding 69,260 shares of no par common and 96,420 shares of $20 par preferred.

Directors also declared a dividend of $4 a share on present common, payable July 1 to stock of record June 20. This brings total dividends for the year up to $8 a share.

Offer Insurance Protection

Group life insurance policies are acquired by Penn. Salt, Philadelphia, and Lindsay Light & Chemical, Chicago, for the protection of their employees.

The Penn. Salt policy involves a total of $1,889,500 and covers 1,090 employees, each one being eligible to coverage in amounts ranging from $500 to $10,000, according to the amount of salary received. The Lindsay policy involves $77,500 and covers 58 employees in amounts ranging from $1000 to $2500, according to rank. Both policies were issued by Prudential and are of the contributory type, the employees themselves paying a part of the premium and the remainder of the expense being assumed by the employing company.

"Killing the Goose"

U. S. Rubber broke a number of precedents last month when it sent a letter to stockholders urging them to protest against the proposed plan to tax corporations which operate as holding companies.

"Taxing corporations unsoundly," the letter says, "is just like killing the goose that lays the golden egg."

Heard Here and There

Smith-Emery Co., industrial chemists and engineers, is celebrating its 25th year of continuous operation in Los Angeles.

National Carbon workers accept truce, ending a 5-weeks strike on June 30th.

Gane's Chemical Works, Carlstadt, was rocked by a $5,000 blast on June 14.

John Sunshine Chemical, 604 W. Lake st., Chicago, is forced to take larger quarters in the same building.

Great interest exists at Warren, Pa., in the remarkable operation of the new white oil plant which Sherwood Refining has just completed. At the time Sherwood took over the Mutual Refining plant, it was in process of shutting down. Sherwood has run day and night since the day they took over the plant, constantly producing more white oil and petrolatum and adding more workmen almost weekly.

Arabol Manufacturing, N. Y. City, adhesives, sizing, softening, finishing and weighting products, is celebrating its 50th anniversary.

Sales in the U. S. by Allied Chemical & Dye in May, '35, were larger than in any month since October, '30, a period of almost 5 years, the company recently announced.

Fires

Fires reported in June:—Cordele Turpentine, Cordele, Ga., one of the oldest and largest producers, on the 8th. Gane & Ingram's chemical plant at Newark,

N. J., on the 17th, $1,000. Superintendent Maurer's timely warning saved the workmen from serious accidents. Fire swept the Reilly Tar & Chemical plant at Newark, N. J., on the 18th. Baugh & Sons' Portsmouth, Va., plant was gutted on the 24th. An unofficial estimate of the loss was $300,000. Large quantity of sodium nitrate was destroyed.

Fumes from a naphthalene kettle in the Alrose Chemical Co. plant in Providence, ignited by spontaneous combustion, flared up and threatened to spread but the flames were checked with chemicals by employees and firemen before they had caused any extensive damage. Date, June 24.

Twenty-five men narrowly escaped death on June 7 in an explosion and fire which caused heavy damage in one of the buildings of the duPont Dye Works, at Deepwater, 5 miles south of Pennsgrove, N. J.

A bolt of lightning touched off a series of terrific explosions and a furious fire on June 29, which wrecked the plant of Empire Distilling, 82d st. and Bartram ave., in the extreme southwest section of Philadelphia.

Seven buildings, one of them a 6-story brick still-house, were reduced to ruins and Benedict Kempff, of Glenolden, Philadelphia, plant superintendent, estimated the loss at $350,000.

Moves

¶Monsanto and Columbia Alkali Move Their N. Y. Offices to Rockefeller Center—Kohnstamm Opens Atlanta Office—Grasselli's St. Louis Office—Other Address Changes—

Monsanto's N. Y. City offices are being moved to the 34th floor of the RCA Bldg. from the Empire State Bldg. Swann offices, formerly in the Graybar Bldg., will be incorporated with Monsanto. Victor E. Williams, Monsanto sales manager for the eastern district, will be in charge.

Columbia Alkali is another to desert Empire State for Rockefeller Plaza.

H. Kohnstamm & Co., laundry supplies, dyes, etc., leases 12,000 sq. ft. of space in the building located at 553 Whitehall st., Atlanta, for an office and warehouse. H. Kohnstamm & Co. was founded in N. Y. City in 1851.

Grasselli has a new office and warehouse in St. Louis at 116 Ferry st.

The Stawhite Chemical Co., manufacturers of Stawhite Clothes Bleach, have moved into their new chemical plant at 12 S. High st., St. Louis. The managers are Robert Branch and F. Filbert Freedenberg.

DuPont Cellophane is taking 10,000 sq. feet in the Port of Authority Commerce Bldg. in N. Y. City.

Hoboken's industrial center is augmented by Lehigh Salt, 1412 Bloomfield st.

Fritzsche Bros. will move in September to new quarters in the Port Authority Commerce Bldg., 111 8th ave., N. Y. City.

Construction

¶Dow Plans Number of Important Plant Construction Jobs—Union Bag Announces $4,000,000 Plant To Use Slash Pine—Other Construction—

Plans are now being drawn which will call for a new 2-story office building at the Dow plant at Midland, revamping the present educational building, doubling the size of the auditorium, constructing a new entrance for the main offices and changes for half a dozen departments. Specifications will be ready about July 15, and at that time bids for material and construction will be considered, according to officials.

Lookout Oil & Refining, Alton Park, Chattanooga, Tenn., an Armour subsidiary refining vegetable oils, is spending $290,000 on expansion and will add 60 to the payroll.

Union Bag & Paper will construct a $4,000,000 paper mill at Savannah to use slash pine (120 tons daily) for making pulp.

Standard Mineral Co. of North Carolina, Hemp, N. C., is erecting a new talc mill.

Tennessee Products, Wrigley, Tenn., is planning a $150,000 acetic plant.

Diamond Alkali awards contract for construction of a 3,200 ft. intake pipe into Lake Erie from its Painesville, Ohio, plant.

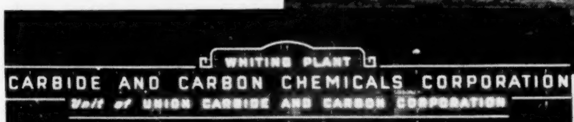
Plants

President Willard Dow Inspects Cliffs Dow Plant at Marquette—Solvay Personnel at Baton Rouge—Chemical Reduction Conducts Plant Inspection—Calco's South Charleston Plant Closed—

June 11 was inspection day at the Marquette plant of the newly-formed Cliffs Dow Chemical. In the evening the guests were entertained at dinner by the directors of the Marquette Chamber of Commerce. Besides President Dow, others making the trip included: Dr. A. T. Beutel and Dr. E. C. Britton, both of the Dow company at Midland. Mr. Dow, Dr. Britton and Dr. Beutel inspected the North Marquette plant and conferred with Mr. Olson, the resident general manager, relative to the plans for its expansion and operation. Building operations were started recently, including reconstruction of retorts and other units and enlargement of the office building which will house the new company's accounting and sales departments.

Solvay Personnel Identified

Solvay's general manager at the new Baton Rouge plant is Carlton Bates who was formerly assistant manager at the Detroit plant. He is a Syracuse University graduate and learned the ropes at the huge Solvay Syracuse plant. Frederick Nill, the assistant manager at Baton Rouge, was formerly at the Mamosberg plant in Canada. R. G. Zimmer, in charge of shifts, is a University of Michigan graduate and was formerly at the Detroit plant. Henry Rynalski, the chief chemist, is also from the Detroit works.



Visitors leaving Chicago over the Pennsylvania have their attention called day and night to Carbide's new $8,000,000 plant at Whiting, Ind., where waste gases from the refinery of Standard of Indiana are changed into important chemicals of commerce. No longer do chemical plants try to hide their identity. Executives now appreciate value of factory publicity. Striking signs were manufactured by Federal Electric Co., of Chicago.

R. S. Law, supervisor, is from Detroit, and H. N. Trott, plant engineer, is from Syracuse. F. C. Tuttle, chief clerk, is from Hopewell, Va., and Frank Reissig, paymaster, is from Syracuse. The other key executives are: W. R. deSilva, purchasing agent; A. R. Meek, traffic manager; E. W. Moales, storekeeper.

Frank Stevens, of the Syracuse office, in charge of construction, is still in Baton Rouge and will remain for several months until the construction work is entirely completed.

Except in the key positions, it is Solvay's policy to hire all plant help locally.

One Hour Instead of 100 Days

Described as revolutionary, a new chemical and metallurgical process for the recovery of products from lead ores was explained to officials of the Glendale and Los Angeles Chambers of Commerce during a tour of the Chemical Reduction Corp. plant, 4850 San Fernando, Glendale, Calif., on May 30, according to Glendale papers. Raw ore material is converted into finished products by the new process in a period of one hour, compared to 100 to 120 days required under methods now generally in use in other plants.

Among products which the local plant is engaged in recovering are white lead, lead chromate and other ore elements used in paints and varnishes. Also being recovered is lead arsenate in powder form for use in killing plant pests.

O. F. Marvin, president and general manager of the concern, who described the new process, said that approximately 28 by-products also are being obtained from the lead ores.

Jacobson Remains At Charleston

Calco's South Charleston, W. Va., plant was dismantled on June 15. Operations stopped on June 1. B. H. Jacobson, manager of the plant, will remain with offices in the Charleston National Bank Bldg. He will act as technical representative. The plant is being taken over by Westvaco. M. G. Geiger, Westvaco manager, busy with reconditioning and remodeling the chlorine cell plant, reports that so far as he knew no immediate plans have been made for utilizing the old Calco buildings. In connection with the chlorine cell remodeling program it was learned that the company is drilling 5 new salt wells in South Charleston and vicinity. Completion of these wells will give it a total of 10.

Charleston Another Pittsburgh?

According to H. D. Houghton, prominent Charleston, W. Va., builder, that city in the not too distant future will look like Pittsburgh, with homes built up all over the surrounding hills. In support of his claim he points out that the Carbide and Carbon plans for plant expansion call for 1,800 more men, perhaps over a period of from 2 to 3 years, which alone would mean new homes will have to be built to house about 8,000 people, almost a city in itself.

Freight On The Kanawha

Construction of loading terminals and operation of barges along the Kanawha River by coal, chemical and other industries entailing and spending of "millions of dollars" is being planned, Ernest M. Merrill, president of the Great Kanawha Valley Improvement Association, reports.

Niagara Falls Plants Represented

Quite a delegation of Niagara Falls chemical men attended the Syracuse meeting of the Associated Industries of N. Y. State held in Syracuse on June [illegible]. Included in the group were: Clarence Wigle, Niagara Alkali, F. W. Dennis, Hooker Electro-Chemical; Dr. John S. Richelsen and W. J. Morgan, both of Vanadium; Norman Duffett, Union Carbide; Peter M. Wilson and William Leach, Mathieson Alkali; R. C. Gagen, National Carbon; Paul S. Brallier and H. C. Van Galder, Niagara Smelting; and E. L. Lasier, Titanium.

Must Comply With Regulations

Fries Brothers chemical plant at Bloomfield, N. J., can continue to operate provided the owners sign an agreement to comply with regulations of the town.

This was decided by the Town council following consideration of protests from property owners who urged the officials to force the plant to leave Bloomfield owing to high explosives in the factory allegedly imperilling the district.

Checked At The "Gate"

Green Island (near Albany, N. Y.) Board of Health postpones action on protest against sulfurous fumes from Marshall Asbestos' plant when company representatives report new vulcanizing process is expected to do away with fumes.

State Advocate Times, Baton Rouge, carried a full page of views of the new Solvay alkali plant in the June 24th rotogravure section.

Arthur E. Peterson, Calco, is chairman of the N. J. State Industrial Safety Committee. Stanley Warzala of the same company is treasurer. On the same committee is E. F. Thoenges of Hercules Powder's Parlin plant.

Grasselli Chemical, Cleveland, reports that their 17 plants operated from Jan. 29, '35, to May 13, '35, inclusive, a period of 105 days, with an exposure of 1,824,555 hours, without a disabling injury.

The Alki News, house organ of the Southern Alkali Corp., is a newsy sheet.

President Galt of Southern Alkali was a visitor at the Corpus Christi plant last month.

Two du Pont plants won special prizes in a nation-wide safety contest sponsored by the National Safety Council for best '34 records. Old Hickory, Tenn., and Deepwater, Del., factories, were 1st and 2nd, respectively.

Two men were injured when a pitch pot became overheated and exploded at the Indianapolis plant of Reilly Tar & Chemical on June 26.

The Pyrites Co. will start up operations at its plant near Wilmington after a shutdown of 3 years. About 200 will be employed.

Expositions

¶ *Outlook For 15th Chemical Exposition Is Bright — Permanent Metals and Plastics Exhibit at Rockefeller Center—*

Indicative of the growing world demand for chemical equipment, the findings of a survey just completed by the Bureau of Foreign and Domestic Commerce, prove naturally accordant the many advance requests for space at the 15th Exposition of Chemical Industries. The Exposition will be held during the week of Dec. 2-7, at Grand Central Palace, N. Y. City. The many new chemical plants established during '34, shown by the survey, are good omens of universal interest in plant modernization, and a sign that the Chemical Exposition will meet a current need. To the 14th Exposition, held in '33, visitors came from 938 cities and towns of 42 states of the United States and from 69 cities and towns of 27 foreign countries, making the total registered attendance 34,269—an increase of 50% over the previous Exposition. The 14th Exposition took place when the pulse of industry gave only vague indications of its slow return to normal.

Now, in '35, $100,000,000 have been set aside for new plant projects in the chemical industries. R. E. W. Harrison, Chief of the Commerce Dept.'s Machinery Division, says, "There is a growing market for machinery of the type suitable for use in plants manufacturing chemicals and allied products, including heavy chemicals, paints, and paint products, pharmaceuticals, toilet requisites, plastics, etc. Almost every country in the world is busy establishing such factories, or modernizing and extending old plants, and many of them have to look to other countries for their machinery requirements."

Metals and Plastics Industrially

A permanent exhibit of metals and plastics will be opened at Rockefeller Center by Metal Products Exhibits, Inc., devoted wholly to the interests of those who specify and purchase materials and parts for industrial purposes. It will feature alloys, ferrous and non-ferrous metals,

plastics, finished and semi-finished parts made from these materials, finishes for metals and plastics, manufacturing processes, designs, styling, etc. It will occupy the 3rd floor of the International Building, latest addition to the Rockefeller Center building program.

Personal

¶*Chemical Leaders Honored at June Commencements — Pierre du Pont Aids Wilmington's Drive for Art Center—Langmuir Wins New Honors—*

A number of outstanding chemists, chemical industrialists, and men prominent in the chemical field were recipients of honorary degrees at various colleges. The list, by no means complete, includes: Princeton, Doctor of Science, Prof. Harold C. Urey of Columbia, recent Nobel prize winner; Bowdoin, Master of Arts, to Frank Gifford Tallman, a du Pont vice-president; Case School of Applied Science, Dr. John J. Grebe, Dow Chemical director of physical research, the degree of Doctor of Science. Dr. Grebe was the principal speaker at the Sigma Xi meeting.

Michael F. Lauro, N. Y. Produce Exchange chemist, received the honorary degree of doctor of science of law from Brooklyn Law School of St. Lawrence University.

Calls Himself A "Slacker"

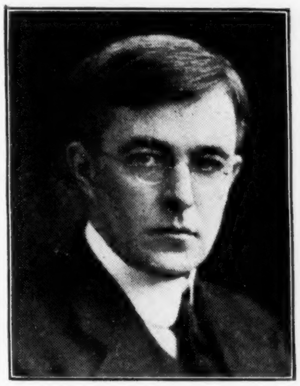
Wilmington's drive for funds for an Art Center ended last month with $367,425 pledged.

Pierre S. du Pont admitted, according to newspaper accounts, that he was a "slacker" at the beginning of the campaign, fearing Wilmington could not raise the amount desired nor arouse any enthusiasm in the campaign. "There has never been such a campaign before in Wilmington," he said. "Had it not been for the small subscriptions, the campaign would not have succeeded." He then offered his congratulations. Mr. du Pont's remarks about being a "slacker" were taken with more than the proverbial grain of salt for he and Mrs. du Pont contributed $25,000 at the outset of the campaign.

A.S.M.E.—Holley Medal

Holley Medal for '34 was awarded on June 20, at the semi-annual meeting of the A.S.M.E. at Cincinnati, to Dr. Irving Langmuir, associate director of the G. E. Research Laboratory, for his contributions to science and engineering.

The Holley Medal was instituted and endowed in '24 by George I. Rockwood, past vice-president of the A.S.M.E., to be bestowed for some great and unique act of genius of engineering nature that has accomplished a great and timely public benefit.



G. E.'S DR. IRVING LANGMUIR

Winner of the Holley Medal and elected to the Royal Society, both in one month.

Nor was this the only honor last month for G. E.'s famous technologist. He was elected to foreign membership in the Royal Society, one of the highest honors British scientists can bestow on an alien scientist. Foreign members are limited to 50 throughout the world.

Rotarians Learn Chemistry

August Merz, Calco vice-president, and the present president of the S. O. C. M. A., told the Bound Brook, N. J. Rotarians last month the story of the founding of the American chemical industry. Present at the meeting were 3 distinguished chemists and engineers from Aussig, Czechoslovakia; Dr. Auerbach, Mr. Asboth, and Dr. Homolka. Visitors have been guests of Calco Chemical in this country.

Charles H. Stone, popular southern chemical distributor and manufacturer, gave a "shop talk" to the Charlotte Rotarians recently.

Another Rotary speaker last month was Norman Hicks of the du Pont dye plant, who spoke before the Middletown, Del., luncheon group on "Economic Trends," and pointed out how chemical processes are changing the industrial field today.

Waldo Hovey, general manager for Niacet Chemicals, was also a recent speaker before the Niagara Falls Rotarians. His subject: "Foreign Trade Agreements."

Dr. William J. Hale, research consultant for Dow Chemical, was guest speaker for Midland Rotarians last month at luncheon at the Country Club.

Dr. Hale's address dealt with the subject of the interdependence between agriculture and industry that he believes is necessary for the rehabilitation of both.

Other Prominent Speakers In June

Cyanamid & Chemical's president, H. L. Derby, was the principal speaker at the combined business and social meeting of the Piedmont Section of the A. A. T. C. & C.

R. J. Thompson, a du Pont refrigeration engineer, was one of the speakers at the recent Building Officials' Conference of America held this year in Indianapolis. He is connected with Kinetic Chemicals, Inc., Wilmington.

United Carbon's assistant chief chemist, Dr. H. W. Grote, is heard by the Charleston Lions Club on June 13 on European business conditions. He recently returned from his 14th European trip in the *Manhattan*. "Gay Vienna" is no longer gay, German business is close to normal except for the difficulty of foreign exchange, the Italian situation is quite similar to Germany, while France is in poor shape, the doctor reported.

Hixson Honored

Columbia's Dr. Arthur W. Hixson who served as chairman of the recent record-breaking A.C.S. meeting, was honored at a dinner June 17. He was presented with a clock inscribed as follows: "To Arthur W. Hixson from the Committeemen of the American Chemical Tercentenary."

Killheffer Returns

Greatly improved after 18 months of complete rest Dr. E. H. Killheffer, former Newport Chemical Works' vice-president and later manager of du Pont's fine chemicals division after the absorption of the former by the latter, returns to active service in the legal department.

Approves Winthrop Memorial

Approval of the suggestion of Francis P. Garvan, president of the Chemical Foundation, that a memorial be established in Hartford to John Winthrop, Jr., first colonial governor of Connecticut and founder of the American chemical industry, was given last month by Prof. J. E. Cavelti of Wesleyan University, president of the Connecticut Valley Section of the A.C.S.

"Who's Who" Write-ups

Columbia's Marston T. Bogert, widely known scientist, after-dinner speaker, chairman of most of the important medalist meetings in and about N. Y., just loses 3rd place by 2 lines (1/8 of an inch) in the length of writeup of his activities appearing in the '34-'35 edition of "Who's Who in America." William Fortune, ex-newspaper man just "edged" Prof. Bogert out of 3rd place with 8 3/16 inches. While most C. I. readers are familiar with the Columbia savant's outstanding scientific accomplishments listed in "Who's Who," a few of the lesser known facts make "news". He is a director in the Rosin Oil Institute of America, member of the advisory council of the Simplified Spelling Board, belongs to the Megantic Fish & Game Corp., and is a commander of the Order of the White Lion of Czechoslovakia.

Engaged

Mr. and Mrs. John Aldridge Chew of Scarsdale, N. Y., and Berryville, Va., announce the engagement of their daughter, Miss Elizabeth Chew, to Mr. John D. Richardson of Chicago, and Gaylord, Va.

Recovering

"Phil" Rising, Chicago representative for Pfizer & Co., is recovering from the injuries received in an automobile accident which occurred while he was driving to the American Pharmaceutical Manufacturers' Association meeting at Hershey, Pa. Mrs. Rising was killed outright.

E. J. Healy is recovering from a major operation at Flower Hospital in N. Y. City. Mr. Healy is with International Products.

Recovering also is Edward Berkholter, in charge of the paper chemicals division of Cyanamid & Chemical, at his home in Hastings from injuries received in an automobile accident.

Births

A son to Mr. and Mrs. William Caspari, Davison Chemical, Baltimore.

A son, Mr. and Mrs. George H. Erwin. Mr. Erwin is a Reichard-Coulston vice-president.

A son, Mr. and Mrs. Daniel B. Becker. Mr. Becker is a Reichard-Coulston salesman.

Miscellaneous Jottings

Mr. and Mrs. Thomas S. Grasselli of Cleveland passed some time last month in N. Y. City, stopping at the Ritz-Carlton.

James T. Pardee, Dow board chairman, is now a 3rd vice-president of the Case Alumni Association.

A. A. Wasserscheid, Mallinckrodt's eastern manager, will spend 6 weeks in California this summer.

Three years on the fascinating rubber plantations of U. S. Rubber in the Far East is the lot of D. S. Villars. On his way out he, his wife and daughter, visited principal Far East ports. He is stationed at the General Laboratories at Boenoet, Kisaran, Sumatra East Coast.

Villanova annually awards the Mendel Medal for outstanding research by a man of the Roman Catholic faith. Winner for '35 is Francis Owen Rice, Johns Hopkins professor of chemistry.

"Dave" Litter, president of D. H. Litter, was chairman of the entertainment committee of the N. Y. Paint, Varnish & Lacquer Association which arranged the outing held at Crescent Athletic-Hamilton Club at Huntington, L. I., on June 24.

President Joseph P. Muzzio of Brooklyn Color Works (lake colors), is celebrating his 50th year in the dry color business.

"The Gangplank"

¶ Littell Sails—Normandie Popular With Ocean-Going Chemical Executives—

Nelson Littell of the patent firm of Hammond & Littell sailed in the *Albert Ballin* on May 30 for a 6 weeks trip to Germany in the interests of American Hyalsol (company controlling American patent rights on "soapless soaps"). Mr. Littell's article on "Playing Poker With Patents" appears on page 13 of this issue.

Benno Elkan, vice-president of International Minerals and Metals Corp., N. Y. City, was aboard the *Normandie* on her first east-bound trip last month.

P. W. Remig of Petroleum By-Products, 44 Trinity Place, N. Y. City, large importers of naphthenic acids, came back last month in the *Europa*. He was scheduled for the *Normandie* but at the last minute was delayed.

Wood Crady, vice-president, Federal Chemical, Louisville, sailed on June 15 accompanied by his sister and daughter for a trip through Russia, Germany, and England.

W. J. Hough prominent Chicago paint raw material distributor, sailed June 15 for a 2 months automobile trip through Europe. He is accompanied by Mrs. Hough and their son, Dick.

Horace V. Corey of Cyanamid's fertilizer division, returned to N. Y. City last month after several months in the West Indies.

M. L. Blanc, president, Acticarbone Corp., left July 10 in the *Normandie* on a 6-weeks trip. Mr. Blanc will visit a number of Acticarbone installations in Europe, particularly in solvent recovery and gas purification fields where there are now some 380 in successful operation.

Mr. Blanc will return in September with Mrs. Blanc and their sons who are visiting in Europe.

Personnel

¶ C. W. Nichols Resigns Presidency of Nichols Copper—Dearborn Gives Up Process Management Direction—Neumann Promoted by N. J. Zinc—

Walter C. Bennett is now president of Nichols Copper. He succeeds C. W. Nichols, who resigned to give more time to his personal affairs. However, Mr. Nichols remains a director of Nichols Copper and of Phelps Dodge. Mr. Bennett has been affiliated with Nichols 34 years, and in recent years has been vice-president and secretary, J. B. Beaty succeeds him as secretary, but the position of vice-president, vacated by the promotion of Mr. Bennett, was not filled. H. J. Hartley continues as a vice-president.

Moore Succeeds Dearborn

R. J. Dearborn, patent counsel of The Texas Co., resigned from the presidencies of Process Management and Gasoline Products. Mr. Dearborn's increasing duties in The Texas Co. made it necessary for him to give up the legal and executive work he has been carrying in Process Management and Gasoline Products. Consequently, he became chairman of the board in each instance. In giving up his active work in directing these companies Mr. Dearborn will be in position to devote more of his time to his regular duties as patent counsel for The Texas Co.

William F. Moore was elected president of Process Management and president of Gasoline Products at the June meeting of the board. His election to the presidency was from the post of vice-president and general manager, which he has occupied for some years.

N. J. Zinc Pigment Manager

R. M. Neumann is now manager of N. J. Zinc's pigment division, succeeding the late Robert Hursh.

Entering the employ of N. J. Zinc in 1906 as clerk in the treasury dept., Mr. Neumann advanced to the office of cashier in 1912. Before the end of 1912 he was promoted to the position of assistant treasurer and assistant secretary of Mineral Point Zinc, a subsidiary, and transferred to Chicago. His appointment as manager of western sales of N. J. Zinc Sales, with headquarters in Chicago, took place in '18.

Prefers Research

Dr. C. A. Browne, assistant chief of the Bureau of Chemistry and Soils, at his own request, terminated his administrative duties July 1, in order to devote his whole time to the supervision of the chemical research work of the Bureau and to the preparation of articles and bulletins upon various unpublished chemical investigations. Dr. W. W. Skinner will succeed Dr. Browne as assistant chief of the Bureau.

Others In Other Fields

A. D. Gill, representative of the Oil Treatment Chemical Co., has transferred office headquarters from Kilgore, Texas, to Midland. Gill will be in charge of the company's business in the West Texas-New Mexico Permian Basin.

James E. Booge, research director of white pigments for Krebs, is at the company's new plant at Newport, Del.

George A. Fisher, former Van Camp research director, is a consultant with offices in Circle Tower, Indianapolis.

Franklin D. Jones, former chief chemist, Phillips & Jacobs, Philadelphia, is on Merck's sales staff.

Lea Manufacturing Co., Waterbury, Conn., manufacturers of buffing and polishing compounds, adds Palmer Langdon to its research staff.

C. D. Clawson, export manager of Ferro Enamel Corp., Cleveland, manufacturers of porcelain enamels and distributors of enameling supplies, left Cleveland, June 10, to become managing director of Ferro's new plant at Sao Paulo, Brazil.

S. Block, formerly of G. A. Wharry & Co., is now manager of the brokerage department of Eastern Color & Chemical, 235 4th ave., N. Y. City.

Equipment

¶*Buell Engineering Enters Equipment Field — Hanson-Van Winkle's Newspaper—Singer Now U. S. Stoneware Consultant*

A newly formed company, Buell Engineering, 70 Pine st., N. Y. City, will build 2 outstanding classes of apparatus in America. They will manufacture the "Buttner" drying systems of the rotary, turbo, and fine-film types, as well as the "Van Tongeren" system of dust extraction for fly-ash from stack discharge as well as for the collection of dust from chemical and cement plants. Burners and pulverizing sets for power and industrial grinding are also to be made. Units will be manufactured by Struthers-Wells-Titusville group which is associated with the new company. It is also linked with Buell Combustion, Ltd., of England, and thereby with New Consolidated Gold Fields.

Hanson-Van Winkle-Munning scored a news beat with *H-VW-M Convention News*, a newspaper issued daily during the recent American Electroplaters' convention at Bridgeport.

Outstanding Stoneware Authority

Dr. Felix Singer, one of the world's foremost ceramists, has just been retained as consulting ceramic engineer by U. S. Stoneware, Akron, Ohio, manufacturers of chemical stoneware and corrosion-proof equipment. Dr. Singer studied chemistry, physics and ceramics in Germany and holds the degrees of Doctor of Science and Doctor of Philosophy of the Universities of Berlin and Erlangen.

He comes from a family of ceramic technicians. For 5 years after the completion of his studies, he operated his own ceramic laboratory in the famous pottery district of Bunzlau, Silesia. At the outbreak of the World War in 1914, he became superintendent of the internationally known Rosenthal Porcelain Factory in Selb, Bavaria, remaining there 7 years. In '21 he joined the Board and was made Managing Director of the Deutsche Ton- und Steinzeug-Werke A.-G., in Berlin and at the same time was elected to the Board of their subsidiaries, the Steatit Magnesia Co. and the Keramische Industrie-Bedarfs-A.-G., both of Berlin.

After his work in the porcelain industry, Dr. Singer began an extensive research program leading to the development of chemical stoneware for many new uses. He succeeded in producing a great many new and special bodies, possessing remarkable physical characteristics. The chemical stoneware industry thus received a new and important stimulus as the result of this work, resulting in the introduction of specific ceramic bodies for different types of service.

Now Living in England

With the political upheaval in Germany in 1933, Dr. Singer resigned his connection with the Deutsche Ton- und Steinzeug-Werke A.-G., and with their subsidiaries, including the ones held in foreign countries. He left the country and charges of high treason, fraud, etc., followed. All legal actions brought against him have since been dismissed, thus completely vindicating his good name. He now resides in England and has already built up a very extensive consulting practice both in England and in France.

McConnell Joins Patterson

W. M. McConnell joins the engineering department of Patterson Foundry & Machine to take charge of the drafting room. Mr. McConnell graduated from Carnegie "Tech" with a B.S. in Chemical Engineering and also has a professional degree of Chemical Engineer. He completed his studies at Columbia, taking special courses. He gained considerable experience in the handling of process equipment and plant design while connected with Koppers and American Cyanamid & Chemical, and he brings another type of specialized experience to the rapidly growing engineering and experimental department of Patterson.

Equipment Co. Personnel

P. J. Potter, former 2nd vice-president of the Pangborn Corp., Hagerstown, Md., is now a director and vice-president. Victor F. Stine, a 25-year veteran of the organization is now in charge of sales with the title of vice-president.

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., manufacturers of temperature, pressure, flow, humidity, time and level instruments, appoints E. D. Wacker, as assistant general sales manager.

Alsop Engineering appoints W. H. Lilly Ohio representative, with offices at 1903 Berkeley ave., Cincinnati.

W. F. Gradolph is now a vice-president of The Devilbiss Co.

Sprout, Waldron and Co., Muncy, Pa. (crushing, grinding, sifting, mixing, elevating, conveying and power transmission machinery), appoint Conite Engineering and Sales Co., Nashville, Tenn., as sales agents for Tennessee, parts of Kentucky and Alabama.

W. A. Hauck is appointed assistant to the president of Lukens Steel.

Washington

¶*Wagner Labor and Social Security Bills in Conference—Question of Coloring in Food—Washington "Jottings"—*

Despite widespread opposition, the Wagner Labor Disputes Bill (S. 1958) passed the House June 19. Through action of the Senate on June 20, in appointing conferees, the bill is now in conference between the two houses for adjustment of differences. Conferees for the Senate are Senators David I. Walsh, Massachusetts; Louis Murphy, Iowa; James E. Murray, Montana; William E. Borah, Idaho; Robert M. LaFollette, Jr., Wisconsin. For the House, conferees are Congressmen William P. Connery, Jr., Massachusetts; Mrs. Mary T. Norton, New Jersey; Robert Ramspeck, Georgia; Richard J. Welch, California; Fred A. Hartley, Jr., New Jersey.

Having passed the Senate June 19, the Social Security Bill (H. R. 7260) is now in conference between the House and the Senate. Two important amendments were adopted by the Senate. They are:

1. The addition of two new sections which would allow States to draft their own unemployment benefit laws so as to permit the development by employers of guaranteed employment plans and separate unemployment reserve accounts, as well as to permit reduction of taxes levied for unemployment benefit purposes for employers that stabilize their employment.

2. This amendment permits the continuance of private annuity plans of the sort now in existence in many business and industrial establishments.

Conferees for the Senate are: Pat Harrison, Mississippi; William H. King, Utah; Walter F. George, Georgia; Henry W. Keyes, New Hampshire; and Robert M. LaFollette, Jr., Wisconsin. For the House: Robert L. Doughton, North Carolina; Samuel B. Hill, Washington; Thomas H. Cullen, New York; Isaac Bacharach, New Jersey; and Allen T. Treadway, Massachusetts.

Check Food Colors

Added yellow color in macaroni and similar products, regardless of the source or nature of the color, constitutes adulteration, says the Food and Drug Administration. In May 37 shipments of these products were seized when analysis

showed presence of soy-bean flour, of tumeric, a vegetable dye, or of a yellow coal-tar food color.

Manufacturers of other commodities, too, in their competitive efforts, resort to artificial colors. Food and Drug Administration reiterates its stand that wherever the presence of an artificial color conceals inferiority, the food containing it is illegal. In cases where added color does not conceal inferiority, the fact of the presence of artificial color must still be declared on the label of the food containing it.*

AAA Test This Fall

Attorney-General Homer S. Cummings last month predicted that the question of constitutionality of the agricultural processing taxes will reach the Supreme Court this fall. A number of suits have recently been introduced to test the constitutionality of AAA.

Reporting On Ethyl Acetate

A model form has been provided by the Bureau of Internal Revenue for the making of daily reports by manufacturers of shipments of ethyl acetate as required by AT-Circular No. 26, dated Nov. 13, '34. Purpose is to get uniform reports.

Exempt From Processing Tax

Molasses and syrup made from sugar cane that is surplus under sugar-cane adjustment contracts have been exempted from payment of the processing tax, if these products are used for livestock feedstuffs or for distillation.

M.C.A. Enters Protests

The M.C.A. registered strenuous opposition last month to provisions of Title 2 of the pending Banking Bill and to the Wagner Labor Relations Bill (S1958).

That Coconut Oil Tax

Congress is being urged by the N. Y. Merchants' Association to pass the Guffey-Dockweiler bill which would amend the Revenue Act of 1934 so as to exempt from the processing tax coconut oil which has been rendered unfit for use as food.

Trade Commission

Alleging unfair competition in the sale of paint, because of misleading statements on the label, the Commission has issued a complaint against C. Rosenblum, Inc., of Baltimore, manufacturer and distributor.

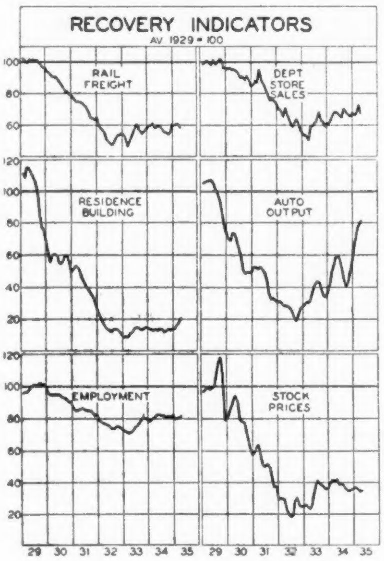
Formal denial of charges made by the Commission that the Finishing Products Co., Indianapolis, had engaged in unfair competition in the sale of stains, lacquers, paints and wood-finishing products will be made to the Commission, William W. Hammond, vice-president of the company, reports.

* It now seems unlikely that the Copeland Food and Drug Bill will get through this session.

Heavy Chemicals

¶*Seasonal Decline In Shipments Reported—Plating Chemicals In Good Demand—Borax and Boric Acid Advanced Sharply—*

Seasonal contraction in the demand for most industrial chemicals appeared in the last half of June. Offsetting this tendency to some degree was the usual pick-up in the call for seasonal items. Anhydrous ammonia, chlorine, and calcium chloride in the heavy chemical group moved into consuming channels in large quantities.



—Cleveland Trust Bulletin

The automotive industry showed very little signs of summer curtailment. June production is estimated at 350,000 units and July schedules call for approximately 300,000. Plater's chemicals are enjoying good volume and the immediate outlook is favorable. Steel activity, on the other hand, is reported at 38%. An optimistic note, however, on steel was sounded recently by W. Frank Detwiler, executive vice-president of Allegheny Steel who stated that he believed that improving fall demand in some quarters and the launching of some new automobile models 3 months earlier than usual should soon offset the usual summer slump.

Many of the largest chemical consuming industries are now in "in-between-seasons." Shoe production is down from the higher levels of March and April with the result that tanners have curtailed somewhat their manufacturing operations. Textile activity is still at a low ebb and certain to go still lower for many of the cotton mills are putting into effect a 50% curtailment of looms for July. Rubber and glass production schedules are holding up remarkably well. Production of plate glass for the first 5 months of '35 is far ahead of the

Important Price Changes

ADVANCED	June 29	May 31
Acid boric	$95.00	$80.00
Borax, 80 ton lots	40.00	36.00
c.l.	44.00	40.00
Sodium silicofluoride	04½	.04¼
Sodium stannate	.34	.33
Tin oxide	.54	.53
DECLINED		
Cobalt sulfate	$0.40	$0.45
Potassium carbonate, calc.:		
80-85%	.07¼	.07½
99-100%	.08½	.08¾
96-98%	.07½	.07¾
80-85% Hyd.	.06	.06¼
Tin tetrachloride	.26¼	.26½
Crystals	.38½	.39

DEPT. OF LABOR STATISTICS

	May '35	Apr. '35	May '34
Employment *a*	107.1	106.9	111.2
Payrolls *a*	97.8	96.2	94.4
	Apr. '35	Mar. '35	Apr. '34
Prices *b*	87.2	88.1	78.6

DATA FOR PROCESS INDUSTRIES

	Apr. '35	Mar. '35	Apr. '34
Paper & Pulp:			
Employment *a*	109.8	109.7	106.8
Payrolls	87.3	88.4	81.3
Rubber Products:			
Employment *a*	82.1	83.3	90.0
Payrolls *a*	70.8	70.6	73.4
Explosives:			
Employment *a*	84.6	88.3	99.2
Payrolls *a*	69.3	73.0	78.6
Soap:			
Employment *a*	102.7	10[illegible].3	104.5
Payrolls *a*	97.0	95.9	88.8

a 1923-'25=100.0; *b* 1926=100.0.

same period of last year, 75,200,760 sq. ft. as against only 41,369,190 sq. ft. According to the *American Glass Review*, "the outlook is for increased production after the warm weather dull period has passed." Soap production is very satisfactory. Despite the recent price advances, sales to wholesalers are heavy. Paper mills are operating at a slower pace.

Back To More Profitable Basis

Outstanding price advance last month was a $4 rise in borax and a $15 rise in boric acid. Highly important reductions were made on both hydrated and calcined potassium carbonate. Calcined was off ¼¢ and is now quoted for the 99-100% grade at 8½¢ to 9¢ for either Boston or Baltimore arrival; for the 96-98% material at 6⅞¢ to 7¼¢. N. Y. City stocks are quoted at 7½¢ to 7⅝¢ and for arrival, 7¼¢ to 7⅜¢. Hydrated was also reduced ¼¢ to the following basis: carlots, 6¢; 10 bbls. or more, 6¼¢; and less than 10 bbls., 6⅜¢. These prices are in each case for the 83-85% grade. The seeming disagreement in price trends between the various tin salts is explained by the fact that the oxide price was based on the May average price for the metal which caused it to be increased, while the tetrachloride and the crystals were lower because the prices for these are set weekly.

Trisodium phosphate in the Metropolitan area is still in a very competitive position. A new schedule was offered

in the middle of last month as follows: 1 to 4 bbls., $3.35; 5 to 9 bbls., $2.85; 6,500 lbs. and over, $2.65. Bags in each case are 20¢ per 100 lbs. In Philadelphia the schedule is: 1 to 4 bbls., $3.75; 5 to 9 bbls., $3.50; 20 bbls. and over, $3.10. All manufacturers are now back on the f. o. b. works price of $2.60 to $3.75, depending upon quantity. A great deal of confusion existed in the New Jersey area following the passage of the 2% state tax for unemployment funds. Several suits were instituted to prevent collection. Manufacturers and dealers are finding a lot of difficulties over questions of sale in N. Y. City and delivery in New Jersey. The N. Y. City emergency tax does not apply on goods shipped out of the city.

Fear that price weaknesses might develop on contracts that were up for review for the last 6 months of the year proved groundless.

Sulfur Companies

An option has been taken on the Leviathan sulfur mine by Texas Gulf Sulphur. Developed by a 550-foot tunnel and lateral workings, the Leviathan is said to contain a vast tonnage of sulfur, with approximately 1,500,000 tons of sampling 40% exposed.

Several shipments have been made to Los Angeles and other points. It is reported that Texas Gulf Sulphur plans extensive operations if sampling of the deposits proves satisfactory.

United Gas owns 74.71% of Duval Texas Sulphur the recent report of the former discloses. Interesting also is the disclosure that the plant started in '34 on Boling Dome is near completion. Report also states that operations on the Palangana Dome were discontinued in March of this year.

Miscellaneous Notes

Columbia Alkali reports that Columbia brand whiting will now be known as "Columbia Filler."

General Chemical took order for 2 cars of alum from the City of Tulsa at $1.5687 per 100 lbs.

Belle Alkali takes City of Richmond's chlorine requirements at $2.51.

Sees Another "Roman Holiday"

Percy Magnus, president of Magnus, Mabee & Reynard and president of the N. Y. Board of Trade, is calling for a test of the Wagner and the Security bills. Said Mr. Magnus: "Social security might better be called national economic insecurity. Labor relations will be the worst in the country's history and there will probably be the most disastrous industrial warfare. American business, which has made this country so great, is being sacrificed to make a Roman holiday. Nero's fiddling seems rational by comparison."

Coal Tar Chemicals

¶One Grade of Cresylic Sharply Higher—Toluol, Xylol and Solvent Naphtha Shortage Continues —Little Change In Coking Operations—

Scarcity of stocks was responsible for a 3¢ advance in the 99% straw color, high boiling cresylic acid. The low boiling and resin grades were unchanged. An advance was also reported in creosote oil, the first change in quotations on this item in many months. Scarcity of toluol, xylol, and solvent naphtha continues. This situation is one that has prevailed for the best part of the current year and with steel mill operations pointing downward (the rate at the close of June was 38%) during the summer months there seems to be little likelihood of any sizable increase in coking operation for 30 or 60 days that would bring in greater supplies. In addition, automotive production is holding up remarkably well, 350,000 units in June and a proposed production of 300,000 for July, so that solvent demand in both the automotive and rubber centers is likely to continue heavy. According to the Brookmire Service, the steel industry this Fall and early next Spring will show a volume of consumption higher than at any time since recovery set in. In their latest report they state:

"The automobile industry should have a bigger year in '36 than in '35, as ability to purchase is being augmented indirectly by the Government, while production has not yet offset obsolescence. Farm income looks moderately higher, and agricultural implements should sell in larger volume in the coming year.

"Miscellaneous steel consuming industries which have been important factors in sustaining operations this year are expected to continue their improvement as a result of enhanced consumer buying power. Reorganization of some railroads now under way is a favorable prospect for increased steel usage, but this may not develop much business within the next 6 or 8 months. Work relief expenditures will add somewhat to steel volumes. Thus the steel outlook is for better volumes."

Other advances included one of 3½¢ in shingle stain and a 1¢ advance in tar acid oil. Industrial benzol prices are firmer. Surplus stocks of motor grade are said to be no longer a factor.

Important Price Changes

ADVANCED

	June 29	May 31
Acid cresylic, H. B. straw	$0.45	$0.42
Creosote oil, No. 1	.12	.11½
No. 2	.109	.10½
Shingle stain, tks.	.14½	.11
Tar acid oil, 15%	.22	.21
25%	.24	.23

May Coking Rate Unchanged

May activity in the coke industry was substantially at the same level as in April. Total output of both by-product and beehive amounted to 2,850,236 tons, or 92,215 tons per working day, an increase of 0.7% in comparison with the daily rate prevailing in April.

Output of by-product coke for the month was 2,793,336 tons or 90,108 tons per day. Compared with April the rate increased 1.2%. Bulk of the increase occurred at furnace plants, where the daily average of 59,761 tons was 1.8% greater than that of the preceding month. At merchant plants the rate remained practically stationary. Production of beehive coke declined sharply, particularly in West Virginia. Stock piles at by-product plants decreased 7.6%, from 3,019,016 to 2,790,706 tons, lowest level reached since August, '34.

Traffic

¶Phosphate Companies Ask Exemption From Rock Rate Increase—I. C. C. Denies Petition On Long & Short Haul Clause—

Question of exempting phosphate rock shipments from the emergency freight charge authorized by the I. C. C. in Ex Parte 115, and carried in Curlett's tariff ICC-A 460, was discussed with the Carriers' Emergency Charges Committee at the offices of the I. C. C. on June 27. Representing the fertilizer industry at the meeting were D. A. Dashiell and A. J. Whittemore of the Association's traffic committee, G. H. Alfriend, and Messrs. Brand, Smalley, and Lodge of the N. F. A. executive office.*

Petition of several railroads for authority to establish commodity rates between points included in the Southern and official territories without observing the long and short haul clause of the Interstate Commerce Act was denied on June 26 by the I. C. C.

Shellac

Buying is spotty and in small quantities, largely for replacement purposes only. The only price change last month was a 1¢ decline in Superfine. London and Calcutta markets were quiet.

Mineral Oil Men Win

Over 230 attended the annual outing of the Oil Trades Association of N. Y. held on June 11 at the Pelham Country Club. The mineral oil men beat the vegetable oil men at baseball, 18 to 16.

* Plea was later denied.

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Fine Chemicals

¶ Seasonal Items In Good Demand—U. S. P. Borax and Boric Acid Higher — Mercury Quotations Slightly Lower—

Such seasonal items as citric and tartaric are moving out in satisfactory volume. Total volume of business in June compared quite favorably with previous months and was decidedly ahead of June of last year. U. S. P. boric and borax were advanced $4 and $15 respectively when the technical grades were "upped." Several of the cadmium salts were finally revised upwards to bring them more in line with the higher cost of the metal. Mercury is somewhat lower, the new schedule being: $71.50 for 50 to 99 flasks; $72 for 25 to 49; $72.50 for 15 to 24; $73 for 5 to 14; and $73.50 for 1 to 4 flasks. This reduction was the result of keener competition between domestic and foreign sources of supply. Most of the mercurials remain unchanged, but both calomel and corrosive sublimate are subjected to price competition between makers.

Distillers reported that the prevailing prices for specially denatured alcohol, completely denatured No. 5, and pure alcohol would be extended for the 3d quarter.

Silver nitrate worked lower again last month. Despite the very active silver policy of this Administration, silver has declined steadily—it has fallen 11¢ in as many weeks and is now at 69⅜¢. While this is much higher than the 32¢ price which prevailed before the present Administration took office, it is quite a loss from the high level prevailing a few months ago.

A few important price changes were reported in the aromatic chemical group and are listed on this page. Price strength in all grades of glycerine remains as one of the features of the market. Iodine and iodides are somewhat less affected by price competition.

Important Price Changes

ADVANCED	June 29	May 31
Alcohol, cinnamic	$ 3.50	$ 3.25
Acid boric, U.S.P., bbls., c.l.	125.00	110.00
Benzylidine acetone	2.35	2.00
Borax, U.S.P., bbls., c.l.	69.00	65.00
Cadmium bromide	1.32	1.25
Iodide	3.70	3.50
Phenylacetaldehyde	5.00	4.80
DECLINED		
Cinnamic aldehyde	$ 1.55	$ 1.65
Diphenylmethane	1.40	1.60
Mercury	71.50	72.00
Silver nitrate	.47	.51

DEPT. OF LABOR STATISTICS	Apr.'35	Mar.'35	Apr.'34
Drugs and pharmaceuticals prices *b*	73.8	73.0	72.2
	May '35	Apr.'35	May '34
Employment, Druggists preparations *a*	96.8	98.9	97.7
Payrolls, Druggists preparations *a*	93.9	97.7	88.5

a 1923-'25 = 100.0; *b* 1926 = 100.0.

Latest in the Camphor Situation

The U. S. Tariff Commission issued findings of fact, June 20, on the subject of the relation of domestic production of synthetic camphor to the consumption. The report summarized: "Although the data on consumption of synthetic camphor covers only 5½ of the 6 months, the domestic production during the same period was sufficiently large so that the ratio of production to consumption during the full 6 months' period will undoubtedly exceed the 50% requirement of the law necessary to maintain the existing rate of duty of 5¢ per lb.

"Domestic manufacturing concerns reported a consumption of 1,102,500 lbs. (preliminary figures) of synthetic camphor during the period Dec. 18, '34, to May 31, '35. Consumption of crude natural camphor during the first 6 months of '35 was in excess of 1,300,000 lbs. (preliminary figures).

"Ratios of domestic production to consumption of synthetic camphor during the first two 6-months' periods, Dec. 18, '32, to June 17, '33, and Dec. 18, '33, to June 17, '34, as previously determined by the tariff commission, were considerably in excess of the requirements for these periods, namely: 25% and 30%, respectively."

Japanese Developments

Outstanding '34 developments in the situation of the Japanese controlled division of the camphor industry were: (1) purchase by the monopoly bureau of the Taiwan Camphor Producing Co. for 3,404,730 yen, thus making the camphor industry in Taiwan a complete government monopoly; (2) allocation of a greater percentage of Taiwan camphor production to buyers in Japan, and a smaller percentage to foreign buyers: (3) increased production; (4) decreased exports to foreign countries; (5) undertaking of a long-range camphor afforestation project calculated to insure the continuance of the Taiwan camphor industry on a large scale; (6) experiments in synthetic camphor production; and (7) an announced increase late in the year in the price of Taiwan camphor sold to Japanese pyroxylin manufacturers.

Total shipments of crude camphor from Taiwan in the first 11 months of '34 were 4,520,953 lbs., compared with 4,292,000 in the first 11 months of '33. Shipments of crude camphor to Japan proper in the first 11 months of '34 were 2,060,898 lbs., against 1,305,999 in the first 11 months of '33. Exports of crude camphor to the U. S. were 2,297,150 lbs., valued at $620,000, in '34, compared with 3,146,006 lbs., valued at $574,233, in '33.

Spanish Mercury Exports

Exports of quicksilver from Spain last year were 20% lower than in '33. Exports to Germany dropped from 156 to 88 tons, to America from 579 to 210 tons and to the United Kingdom from 405 to 403 tons.

Merck A. A. N. A. Member

Merck is elected to membership in the Association of National Advertisers, with Advertising Director Douglas W. Coutlee representing the company.

Chemical Specialties

¶Insecticide & Disinfectant Convention A Success — Du Pont Announces A New Addition to No. 7 Line—Company "Doings"

Charles P. McCormick, president of the Baltimore company bearing the McCormick family name and president of the National Association of Insecticide & Disinfectant Manufacturers, told the members assembled at the semi-annual meeting (held in Chicago at the Edgewater Beach Hotel last month) that the insect population of America costs the human population a billion dollars a year. He broke down this staggering sum as follows: Moths, he claims, eat $200,000,000; other insects eat grains, fruits, vegetables; termites eat houses; flies eat or spoil food; total about $800,000,000, as close as anyone can guess. It costs us, according to Mr. McCormick's estimate, $8 a year for each American to maintain our insects in the style to which they are accustomed.

Despite a good deal of rainy or threatening weather which detracted somewhat from the advantages of a convention at Chicago's most exclusive North Shore hotel, the summer meeting was outstanding for many reasons notably the character of the program which included Dr. F. Tattersfield, England's most prominent authority on pyrethrum and derris (guest of the S. P. Penick Co.); the snappy and business-like sessions run through on schedule by President McCormick; also the number attending. The Association went on record as favoring continuance of the hours and wages prevailing during NRA. Another forward-looking step was the formation of a

publicity committee to keep the public correctly informed on insecticide and disinfectant matters.

Month's Outstanding Product

Finishes Division of du Pont adds to its No. 7 line of chemical specialties a new Du Pont Radiator Cleaner that exhaustive tests show will not rust or otherwise damage aluminum or aluminum alloy or other metal parts in auto motors or radiators. Many of the more modern motors use aluminum as a part of their cooling system.

Tests also show that permanent spots will not develop on Duco, Dulux, baked enamel or chromium if this cleaner drops on them. Du Pont chemists even boiled chromium plated metal and aluminum and aluminum alloys in a solution of the new cleaner, but found no tendency to even spot the metals. Photograph of the container is shown in the Packaging Section, page 49.

Other Introductions In June

Noxx Chemical, 1131 E. Main st., Columbus, Ohio, is making a new general household and agricultural insecticide, "P.S.T."

Sper Chemical, W. Cumberland ave., Knoxville, is offering a new chemical for soot removal.

Advertising Campaigns

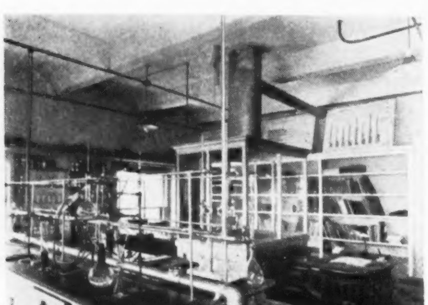
The Black Flag Co., Baltimore, starts its largest national newspaper advertising campaign which will run throughout the summer. Series, released by W. G. Griesmer, is planned to educate the housewife to beware of the apparently harmless though actually dangerous pests and instruct them in the methods of eliminating the pests.

Dri Brite, Inc., St. Louis, appoints Ruthrauff & Ryan, Inc., to handle the advertising of its self-polishing wax. Magazines, newspapers and radio will be used.

B. T. Babbitt, makers of "Bab-O," were offering one free can to every purchaser of 2 cans in the territory adjacent to N. Y. City.

Producing Private Formulas

Allen E. Rogers (internationally known tanning expert and long-time member of Pratt Institute faculty) opens Allen E. Rogers Laboratories, 72 Grand ave., Brooklyn, with complete facilities for manufacturing private brand chemical specialties.



One of the largest, yet one of the newest producers of household specialties is the Baldwin

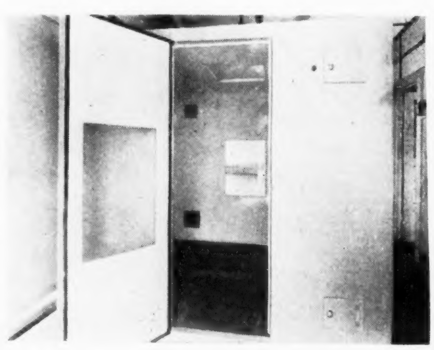
Marketing A New Product

So much has been written and spoken on the necessity of making complete market surveys before attempting to market a new product, or to extend the use of an improved item, that it seems almost unnecessary repetition to go into this question again, Claudius T. Murchison, director of the Bureau of Foreign and Domestic Commerce, Dept. of Commerce, stated recently, in announcing the publication of a new study, Check Sheet for the Introduction of New Industrial Products. "Yet," continued Mr. Murchison, "time after time manufacturers undertake to sell a new industrial item, or a complete new line, with only the vaguest knowledge of the marketing problems before them.

*Month's outstanding **automotive** chemical specialty accessory is the Mobilwax Pad by Socony-Vacuum.*

"Any executive responsible for the successful marketing of a new industrial product should realize at the outset that his problem deals with every movement of the merchandise from the completion of manufacture to possession by the final consumer; and, in case of products subject to servicing need it may extend indefinitely further.

"In view of the existing conditions the study just issued should serve as a valuable guide to the solution of many problems which arise and should be solved if a new marketing venture is to be economically successful. The check sheets cover basic questions and can be obtained through any of the Bureau's District Offices to be found in principal cities, for 5 cents each."



Laboratories of Saegerstown, Pa., makers of "Dwin" products. Under the progressive leadership of H. W. Baldwin, president, and Dr. C. M. Gevin, research director, new laboratories, left, and a Peet-Grady test-room, above, have just been completed.

Packaging Information

Chemical specialty manufacturers often ask for a book on packaging. "How to Package for Profit," by Managing Editor Larrabee of *Printers' Ink*, critics agree is an outstanding contribution. Harper & Brothers, $3.50.

Study Brand Familiarity

University of Chicago's School of Business finishes an enlightening study of the subject of "Brand Familiarity and Brand Prestige." July Publication will contain an article on "Sales Quota Determination."

With the Specialty Houses

The B. J. Pollard Co., 14,300 Prairie ave., Detroit, operates a fleet of spraying trucks equipped with calcium chloride in liquid form. President Pollard reports excellent business from property owners who appreciate the service side of the business.

Park Chemical, Detroit, manufacturers of chemical specialties, lacquer rubbing and polishing compounds, is introducing its products in the Ohio territory.

Liquid Veneer, Buffalo, is forming a new sales agency, Liquid Veneer Sales.

Apex Chemical, Apex, N. C., wins contract on a number of specialties from N.C. Division of Purchase and Contract.

Waxes

The wax markets were featured last month by a sharp rise in Carnauba. Indications are, according to Brazilian reports, that the crop will be small. Spot stocks in this country are very small and dealers are firm in their quotations fearing that replacement prices will be much higher. The only other price change of importance was a slight reduction in Japan. Generally speaking, the call for waxes was close to normal for this period of the year.

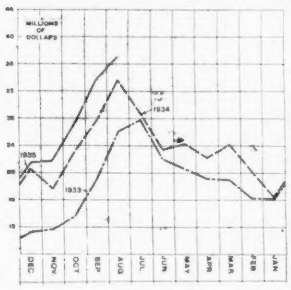
Important Price Changes

	June 29	May 31
ADVANCED		
Carnauba, No. 1, Yellow	$0.41	$0.38½
No. 2	.39½	.38½
No. 2, N. C.	.35	.33
No. 3, Chalky	.32	.31
No. 3, N. C.	.32	.31
DECLINED		
Japan	$0.07	$0.07¼

Paints, Lacquers and Varnish

¶Buying of Raw Materials Declines In June—Building Figures More Encouraging—Retail Sales Are Holding Up Well—

Lead prices lost ground early in June with the result that red lead, litharge, and orange mineral quotations were reduced. All chemical color prices were renewed for the third quarter at unchanged levels. This was reassuring to the producers, for there was some feeling about in the trade that with the NRA at an end price weaknesses might develop.



Paint, varnish and lacquer sales totals continue ahead of '34.

Raw chemical paint materials were in good demand for the better part of June but some slackening in the pace appeared in the last 10 days of the month. Retail sales are holding up well and preliminary reports for June are very encouraging. In most quarters it is agreed that so far the season is the best in 5 years. May paint sales as reported by the Census Bureau show a total of $37,055,459, compared with $33,721,336 in April and $36,614,819 in May a year ago. Total sales for the first 5 months of this year reached $141,526,621, as against $122,728,092 in the same period of '34 and only $81,804,529 in '33.

Lacquer sales in May were under the total for May of last year, the 2 figures being $2,050,608 and $2,267,320 respectively. It is thought that the inroads of the new synthetic resin finish for automobiles is largely if not wholly responsible for this decline. It is the larger producers of cars, such as Ford, where the baked enamels offer the greatest possibility in the way of economy.

Residential building awards continue to show encouraging improvement over the totals for '34; volume reported in 37 eastern states during the initial half of June, amounting to $25,779,200, almost equaled the total reported for the full month of June '34. "Coming on top of a substantial improvement in May the current gain assumes even greater importance," says L. Seth Schnitman, Chief Statistician, F. W. Dodge Corp. May residential contract total was about 6% greater than in April and about 80% ahead of the residential volume recorded for May, '34.

Important Price Changes

ADVANCED	June 29	May 31
Casein, dom., 20-30	$0.11¼	$0.12
80-100	.11¾	.12½
DECLINED		
Red lead, 95%	$0.06½	$0.0615
97%	.06¾	.07
98%	.07	.0725
Litharge	.05½	.05⅞
Orange Mineral	.09½	.09¾

DEPT. OF LABOR STATISTICS

	May '35	Apr. '35	May '34
Employment *a*	112.6	109.2	107.4
Payrolls *a*	95.1	91.9	87.9
	Apr. '35	Mar. '35	Apr. '34
Prices *b*	79.2	79.4	79.8

a 1923-'25=100.0; *b* 1926=100.0.

Writing in the July *Architectural Record*, Mr. Schnitman states: "Because of continued expansion in activity in private as distinguished from public undertakings, the May contract total for all classes of construction was the largest thus far recorded for any month of '35. Total construction awards in the 37 eastern states during May amounted to $126,718,600 as compared with $124,020,000 for April and $134,363,700 for May, '35. On the May, '35 total, residential building amounted to $44,901,500 or about 35%. In April, residential total was $42,202,800 while in May of last year residential awards were only $24,840,200, or less than 20% of all construction."

N. P. V. & L. A. Committees

Quarterly committee meetings of the N. P. V. & L. A., held at Atlantic City in the last week of the month, dealt with such subjects as the effect of the Supreme Court's decision on NRA; the tung oil situation, supplies, reasons for scarcity, future possibilities of supplies; and the development of suitable substitutes. Patents affecting industrial finish manufacturers; trends of government activities in competition with industry; the effect on distribution of the use of formulae labeling; and the promotion of quality products were other subjects discussed.

Baltimore Paint & Color is said to be the first paint producer to dress up its products with a carton. Another new feature is a guarantee in the form of an insurance policy in every carton. Company reports that sales increased rapidly after these two new features were added.

The Perfect Host

Krebs Pigment officials were the perfect hosts in entertaining 93 members of the N. Y. Paint and Varnish Production Club at Wilmington on June 21 to 23. Inspection of the new pigment plant at Newport, Del., proved to be a revelation to most of the members. Equipped with flowsheets the visitors were shown every step in the various processes and carefully investigated every nook and cranny in the huge plant. Krebs' test fences were minutely inspected by most of the technicians. Golf, tennis, tours and dinners and other amusements kept the production club members busy practically every minute during their stay at the Hotel duPont.

Before returning Sunday evening the visiting group presented Zack Phelps, Krebs vice-president with a bronze tablet commemorating the enjoyable and instructive trip.

New Sectional Officers

Cleveland, Kansas City, and Chicago Paint, Varnish & Lacquer Associations elected new officers last month as follows:

Cleveland — president, Robert L. Hutcheon, Passonno-Hutcheon Co.; vice-president, F. B. Wickham, Glidden; treasurer, J. A. Gehring, Pittsburgh Plate Glass; secretary, N. W. Putnam, Imperial Color Works.

Kansas City—president, L. O. Hawkinson, vice-president, Davis Paint Co.; vice-president, D. L. Morton, Eagle-Picher Sales (the retiring president); secretary, A. A. Sherwood, Bertram Naphtha Co.; treasurer, Charles S. Ross, Abner Hood Chemical.

Chicago—president, Edward L. England, manufacturers' representative; vice-president, C. D. Sproule, Pratt & Lambert, Inc., the retiring president; treasurer, M. J. Eberhart, American Can; secretary, M. K. Pine, Muralo Co.

New Application Form

A new form of application blank for Class A membership in the N.P.V. & L.A. is now being used in securing new members. New form is printed on both sides of a single sheet of paper, and requires but one signature. Previously, the application, the Non-Exchange Agreement and the Anti-Bribery Agreement were separate features that required separate signatures, but this has been simplified by the consolidation of the 2 agreements with the application form.

Closer Association

Consolidation of the National Wholesale Paint Association with the N. P. V. & L. A. was unanimously recommended by the consolidation committee of the

wholesalers' organization on June 20. Wholesalers will form a division of the N. P. V. & L. A., and the group will have its own officers, including a full-time secretary.

Litigation

¶ Paramet Wins In Important Resin (Kienle) Patent Suit — Glidden Is Victor In Alcohol Tax Case—Other Important Decisions In June—

Paramet Chemical was declared the winner in the important patent litigation over the Kienle patent, in a decision rendered on June 12 by Judge Campbell of the U. S. District Court for the Eastern District of N. Y. General Electric brought the action against Paramet. The Kienle Patent had to do with resinous condensation products and a process of producing such resins.

In his decision Judge Campbell held that the patent was invalid for want of invention and that certain claims were invalid because they were broader than the product to which they were applied.

Must Sue In W. Va. Circuit

Chadeloid Chemical, N. Y. City, which started suit against National Cash Register, and Kay & Ess, lacquer manufacturer, both of Dayton, alleging infringement of patents covering manufacture of wrinkle finishes, has been restrained from filing suit in the U. S. district court except in the court for the district of West Virginia, which includes Dayton.

An injunction to confine the litigation to the jurisdiction of the West Virginia circuit was filed in Dayton last month. Suit had been originally filed in the Southern N. Y. district court in Brooklyn and later was withdrawn by Chadeloid.

Vitro Sues Ceramic Color

Ceramic Color and Chemical Manufacturing and its president, William F. Wenning of New Brighton, Pa., are named defendants in a patent infringement suit filed in Federal Court by Vitro Manufacturing of Pittsburgh. Both companies produce colors for the glass and ceramic fields.

Glidden Defeats Government

Decision handed down in favor of Glidden in the Government's suit charging the company owed $2,200,000 plus interest on alleged alcohol taxes. Government had charged that the company's tax return for the year '28 was improperly made out and that an item involving the sum in question had been omitted.

Raymond Bros. Winner

Raymond Bros. Impact Pulverizer, Chicago, is winner in a suit brought against Joseph Levy of Aberdeen, N. C. Action was in the form of a creditor's bill to have certain deeds made by Joseph Levy and wife to Sadie Goldman and others and finally to the North Carolina Corp. set aside on the grounds of fraud.

Republic's Patents Held Infringed

U. S. District Judge F. P. Schoonmaker hands down a decision in federal court at Pittsburgh to the effect that the National Tube Co., subsidiary of the U. S. Steel Corp., has been infringing the Johnson and the Belmont patents used by Republic Steel and subsidiaries in the manufacture of progressive resistance electric welded pipe and tubing.

$500,000 For A Formula?

Because, it is alleged, the Bank of America (San Francisco) made an unauthorized delivery of a formula for hardening nickel, it was made defendant last month in a $500,000 damage suit. Action was filed by I. M. Peckham, former U. S. attorney in behalf of the Columbia Metaloy Corp. and concerns a formula developed by Lawrence Zamboni, a San Francisco inventor.

Textile and Tanning Chemicals

¶ Textile Situation Gets Worse Instead of Better—Shoe Producers In Dull Season—Chemical Buying Spotty—

Production schedules in the cotton-cloth production centers will be cut sharply in July, many mills will be closed entirely for the first 2 weeks of the month, others are ordering a 50% reduction in loom operation for the month. Silk mills are at seasonally low levels also. The woolen mills are doing better but are at a discouraging low rate of activity. Rayon is a brighter picture. Correspondingly, the finishing and dyeing plants will operate at a very slow pace.

While the cut in schedules in the tanning and shoe centers was not as drastic as in the case of cotton-cloth production, nevertheless, both fields are slow. Official opening of American leathers for Spring, 1936, will take place at the Waldorf in N. Y. City on Sept. 9-10, according to the exhibit committee of the Tanner's Council. Tanners are busy now on samples in preparation for this important event.

In the silk field indications are that pure dye silks and well styled synthetic yarn novelties will receive the most attention this Fall with little attention being given to the weighted types. Buyers report also that while black will undoubtedly come back strongly in the Fall, the novelty hues, particularly lilac and purple tones, will be very popular. New browns, wine tones and greens will also get "quite a play."

Hand-to-Mouth Purchasing

As a result of the rather poor rate of manufacturing activity in the textile and leather fields, purchasing was spotty last month, with buyers showing a desire to maintain stocks at a minimum. Too, the close proximity to the semi-annual inventory period has much to do with the quiet conditions prevailing. The rather tight position on egg products that has harried the markets for egg yolk and egg albumen for several months appeared corrected with the result that prices were somewhat easier. The demand in recent months favored more egg yolk than egg albumen and there is a surplus of the latter. Tin was off in the past month with the result that the crystals and the tetrachloride were reduced. However, the outlook seems favorable to higher prices. The world's visible supply in tin is again nearing a record low, June statistics reveal. On the other hand, the International Tin Committee meeting in the Hague, has decided to raise the export quota during the 3d quarter from 45 to 50% of the standard tonnage of '28-'29, an increase of a little over 10%. This will permit additional shipments of about 8,280 tons annually.

Important Price Changes

ADVANCED	June 29	May 31
Myrobalans, J1	$23.50	$23.25
Tin oxide	.54	.53
DECLINED		
Albumen, egg, imp.	$ 0.85	$ 0.90
Egg yolk, spray	.53	.55
Mangrove bark	28.00	29.00
Tin crystals	.38½	.39
Tetrachloride	.26¼	.26½
Valonia, beards	40.00	41.00
Wattle bark	29.00	29.25

DEPT. OF LABOR STATISTICS	Apr.'35	Mar.'35	Apr.'34
Textiles:			
Employment a	97.2	99.2	99.1
Payrolls a	82.4	86.8	79.8
Leather:			
Employment a	91.5	92.7	92.3
Payrolls a	79.1	84.1	82.1
Dyeing and Finishing Textiles:			
Employment a	114.6	116.9	116.4
Payrolls a	95.7	100.3	94.8

a 1923-'25 = 100.0.

Fall Silk Colors

The regular edition of the 1935 *Fall Silk Card*, showing 56 colors, has just been released to members of the Textile Color Card Association. In addition to the 2 highlighted features, *"Crushed Pastels"* and *"Arabian Nights,"* card portrays outstanding basic shades especially arranged in the card with lighter tones to suggest the smartest color harmonies and contrasts. In the basic group are several important shades in keeping with the Italian Renaissance influence in fashion.

, , , Modern

CHEMICAL Developments

XIX

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A coat of nitrocellulose lacquer improves the appearance of cartons, makes them resistant to water, grease, dirt, and the scuffing which sometimes results when they rub against each other in transportation.

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Paint ingredients are more completely dissolved in Hercules Steam-distilled Wood Turpentine. Fewer marks are left by the brush when this solvent is used. A recent improvement has narrowed the specifications and made a product having a very pleasant odor.

51. IMPROVED BLACK BLASTING POWDER

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Soluble Yarmor Pine Oil lowers the surface tension of dye liquor, and allows it to penetrate the hardest fibers and the heaviest seams. Yarmor also has dispersing properties and deposits the dye in an even, level manner, producing properly matched shades of depth and brilliance. It is not affected by alkalies or hard water.

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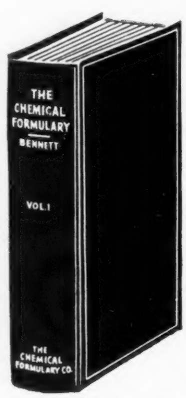

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Oils and Fats

¶*Oil Prices Declined Last Month—Tallow Futures Market Opens In N. Y.—Lard Supplies At Low Point—*

In line with most of the commodity markets the oils and fats generally worked down to lower levels in the past 30 days. The oils and fats index of the National Fertilizer Association declined from 80.8 on May 22 to 67.4 on June 22. A year ago, however, it stood at 51.4. With the decline in prices came some hesitancy on the part of buyers towards future commitments and much of the business transacted was of a replacement nature. One important reduction was that made in chinawood. A good deal of this lowering of price was directly attributable to the decline in silver and the revisions in exchange. Nevertheless, for the paint field the price is still greatly out of line and the trade is genuinely worried over the situation.

Outstanding event in the markets last month was, of course, the opening on June 24 of the tallow futures market on the N. Y. Produce Exchange. This will help, it is expected, to broaden out trading in the oils and fats. Previously, the cottonseed futures market, established in 1904, was the only futures market in the oils and fats field. Now soap manufacturers and other large tallow consumers will be able to "hedge" on future commitments. The new market should lend stabilization to the group as a whole.

Sales of coconut are at a very low ebb, it is reported. Copra sank further last month. The crude fish oils were generally lower and the same was largely true of the principal animal oils.

Cottonseed Declines

Cottonseed oil prices declined last month on the average of about 20 points, as the following comparison of end of the month quotations indicates:

	June 29	May 31	Last year
June	9.75-9.80	10.00	5.85-5.90
July	9.80-9.95	10.19-10.21	5.85-5.92
Aug.	10.04-10.08	10.20-10.40	5.90†
Sept.	10.08†	10.23	5.97†
Oct.	9.95-10.10	10.19-10.20	6.04 6.08
Nov.	10.05†	10.15-10.30	6.17†
Dec.	10.08-10.12	10.13-10.14	6.21-6.24
1936			
Jan.	10.08-10.20	10.10-10.20	

† Sales.

Reports of drastic deterioration of the cotton crop in Texas, Oklahoma and Arkansas indicate that the '35 yield may fall well below early estimates. Private trade estimates have placed this year's crop at from 10,000,000 to 11,000,000 bales. Unfavorable growing conditions have continued since these estimates were first compiled. This would compare with an estimated 12,000,000 bales expected by many in the trade earlier this season, according to the *N. J. Journal of Commerce*.

Lard also lost ground last month. On the bullish side is the report that the Spring pig crop was 20% less than '34 which was a small pig year. Lard stocks on June 1 were officially reported the smallest in 12 years.

Naval Stores

¶*Naval Stores Prices Sink As Uncertainty Continues In Primary Centers—*

Outstanding event in the naval stores field last month was the general protest registered against the CCC maintaining but one office at Jacksonville. Savannah factors feel that this is a decided injustice. There is also much discontent with the length of time required to get loans through.

DEPT. OF LABOR STATISTICS

	Apr.'35	Mar.'35	Apr.'34
Turpentine & rosin:			
Employment a	99.2	99.7	101.2
Payrolls a	57.9	52.3	53.7

a 1923-'25 = 100.0.

Market for rosin and turpentine passed through another quiet month with prices going lower; in the upper grades, sharply lower. The trend of prices is shown in the following comparison of end of the month prices; also a comparison with Government loan values is highly significant.

SAVANNAH

	May 31	June 29	Gov. Loan Value
B	$3.40–45	$3.50	$3.50
D	3.80–85	3.90	4.00
E	4.00	3.95	4.00
F	4.25–30	4.05	4.00
G	4.45	4.30	4.50
H	4.45–47½	4.30	4.50
I	4.45–47½	4.30	4.50
K	4.50	4.30	4.50
M	4.50–55	4.35	4.50
N	4.95	4.70	5.00
WG	5.25	4.80	5.00
WW	6.20–25	5.50	5.50
X	6.25	5.50	5.50
Turpentine	.46	.43½	...

Solvents

¶*Alcohol Prices Continued—Petroleum Solvents Markets Firmer In Mid-Continent Field—*

Alcohol producers finally announced that completely denatured No. 5, specially denatured, and pure would be quoted for the 3d quarter at unchanged prices.

DEPT. OF LABOR STATISTICS

	Apr.'35	Mar.'35	Apr.'34
Petroleum refining:			
Employment a	108.3	107.9	107.8
Payrolls a	96.5	96.4	92.0

a 1923-'25 = 100.0.

Further strengthening of the mid-continent petroleum solvents' price structure appeared last month although not all of the producers were in accord in the advance. As a result there existed quite a spread in quotations in the mid-continent area. These differences are indicated as follows: Cleaners' naphthas, 6⅞-7¼¢; lacquer diluents, 7⅞-8¢; petroleum thinners, 5⅞-6⅛¢; rubber solvents, 6⅞-7¼¢; Stoddard solvents, 6⅜-7¢; and V. M. & P. naphthas, 6⅞-7¼¢. Prices on the Pacific Coast and at the East Coast refineries were unchanged.

Solvent consumption remains at high levels. The paint, varnish and lacquer manufacturers, tire manufacturers and other large consumers are withdrawing supplies at a pace that is generally better than was earlier anticipated for the summer months. Introduction of the newer automotive finishes by some car manufacturers in place of nitrocellulose lacquer, has not changed the total consumption of solvents materially, but it does permit the use of cheaper solvents.

Gums

Price changes were relatively few in the gum field. Demand for varnish gums is reported as being seasonably fairly satisfactory, but as one dealer remarked, that is seldom very large. A few price changes were reported in grades of copals and damars. These were higher because of higher replacement values in primary centers. Ester prices were renewed for the 3d quarter unchanged.

Important Price Changes

ADVANCED

	June 29	May 31
Copal, East India, black bold, scraped	$0.06⅞	$0.06½
Hiroe Macassar, pale bold	.10	.09½
Dammar Singapore, No. 1	.16⅛	.15⅝
No. 2	.12⅛	.11½
Dust	.05	.04¾

Importers Golf

American Gum Importers' Association outing held June 11 at the Westchester Country Club attracted 35 members and guests.

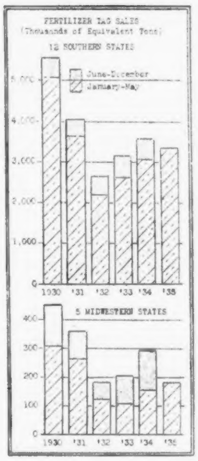
Receipts, Shipments and Stock, Week Ending June 26, 1935

	Stocks March 31, 1935		Receipts		Shipments		Stocks	
	Spirits	Rosin	Spirits	Rosin	Spirits	Rosin	Spirits	Rosin
Savannah	23,791	115,102	34,983	123,339	25,941	120,813	32,833	117,628
Jacksonville	36,833	104,354	27,627	113,843	21,508	112,516	42,952	105,681
Pensacola	25,586	32,301	9,921	28,769	7,772	10,926	27,735	50,144
Other Southern Ports	17,748	66,583	19,072	63,785	12,270	42,107	24,550	88,261
Interior Yards	11,630	36,837	12,927	12,489	11,770	10,492	12,787	38,834
Totals	115,588	355,177	104,530	342,225	79,261	296,854	140,857	400,548

Fertilizers

¶May Sales Are Heavy—Uncertainty Over Prices Prevails—N. F. A. Elects Melvin And Adopts New Plans—

May fertilizer tax tag sales in 12 Southern states, as reported to N. F. A., amounted to 236,766 tons. This was the largest quantity reported for any May on record and exceeded sales in May of last year by 54%. Seasonal decline which took place from April to May was less than that which usually occurs, due to the relatively high level of sales in May and to the unusually small April sales.



Fertilizer sales spurt in May.

Declines from May, '34 were reported by 3 states but these were much more than offset by the increases in the other 9. Particularly sharp increases were reported by South Carolina and Georgia.

Sales in the South in the first 5 months of this year aggregated 3,376,963 tons, an increase of 12% over the corresponding period of last year and 30% over the first 5 months of '33. Sales this year, however, have been below '30, the peak year, and also below '31. The only 2 states which have failed to show larger sales this year to date than in the same period of last year are Tennessee, with a very slight decline, and Arkansas.

Sales made in the Southern States in the January-May period have averaged 85.5% of the total year's sales in the last 4 years. Sales in May have accounted for 5.5% of the entire year, on the average. According to the usual seasonal pattern, sales decline from the Spring peak until July and then rise slightly. Tag sales in the South for the cotton crop year to date, from Aug. 1, through May, amounted to 3,837,251 tons, an increase of 9.8% over the corresponding period of last year.

Price Uncertainty

A new fertilizer season started July 1 under conditions that could hardly be called auspicious. Despite efforts of the N.F.A. to hold the stabilization obtained under NRA price cutting on mixed fertilizer is common. At first the reductions were done quietly but later they were openly announced. The industry is well aware of the problem ahead and a good part of the business sessions, and many of the more informal group gatherings at the June convention at White Sulphur were devoted to this important phase.

Important Price Changes

ADVANCED

	June 29	May 31
Nitrogenous, West., Sept.-Dec., delv.	$2.00	$1.90
Tankage, Chgo., fert. grade	2.35	2.30

DECLINED

	June 29	May 31
Ammonium sulfate	$23.50	$24.00
Blood, imp.	2.75	2.80
Bone, 3 and 50 steamed	20.00	21.00
Bone, raw 4½ and 50	24.00	24.50
Castor Pomace, imp.	17.25	18.75
Menhaden scrap	2.25	2.50
Fish meal, Baltimore	37.00	39 00
Fish meal, Jap.	22.75	33.00
Potassium nitrate (fert.)	45.00	48.00
Superphosphate 16%	8.25	8.50
Run of pile	7.75	8.00
Tankage, grd., N. Y.	2.50	2.60

DEPT. OF LABOR STATISTICS

	Apr.'35	Mar.'35	Apr.'34
Fert. mat. prices *b*	66.0	66.3	68.7
Mixed fert. *b*	72.9	72.8	72.7
	May '35	Apr.'35	May '34
Employment *a*	110.1	155.3	111.8
Payrolls *a*	91.7	119.9	84.0

a 1923-'25=100.0; *b* 1926=100.0.

Fertilizer materials are also decidedly weaker. Ammonium sulfate was openly quoted at $23.50 last month. This price had been privately quoted by resellers for several months. Speculation on the new sulfate price was rife. According to some the schedule will be lower, possibly $2 a ton lower than the '34 official price, of $24 a ton. A part of last season's tonnage was sold at a $22 figure, it will be recalled. On the other hand, stocks are not unduly large and further, there is a good export market particularly with Japan. The whole question is one of uncertainty. Naturally what is done in sulfate, and cyanamid, will depend upon the final outcome of the negotiations being carried on in various European capitals by members of the nitrogen cartel. There seems to be little doubt, however, that the pact will be renewed. By way of marking time nitrate suppliers here first offered material in July at unchanged price levels. Later, the Chilean representative offered nitrate through Nov. 30 at the current quotations.

In some quarters the opinion was expressed that discounts might yet be allowed on the recently announced potash prices.* Superphosphate prices are lower. A few months ago an advance seemed almost a certainty. Not all of the producers reduced their quotations, and a few are still insistent that higher prices will finally prevail.

Several of the organic ammoniates were off from previous levels. Fish scrap prices were weaker both in the Baltimore area and on the Pacific Coast.

Cuts In Mixed Goods

The cuts in mixer fertilizer prices were restricted to Fall goods only, the Spring schedules still being in effect. It is hoped that the various zone meetings will be instrumental in preventing any demoralization of the price structure.

Consumption in the fertilizer year just ended is estimated at about 6,000,000 tons, or about 10% above the figure for '34. Most of the gain is said to have been cornered by the small producers with the "Big 6" obtaining just about the same tonnage.

Fertilizer manufacturers in an endeavor to provide some price stability next year have organized the industry into 12 zones with 12 sub-associations under the National Fertilizer Association. Plan is to carry on voluntary codes under the approval of the Federal Trade Commission. It is provided in the new rules that a manufacturer must notify the association of a change in price on the day that it is made. Under the NRA it was required to notify the association of a change in prices 10 days before it went into effect. Members of the association have deposited a membership fee which will be forfeited in case of infraction of the rules.

In Place of N. R. A.

With an attendance totaling 461, an increase of 12% over the preceding year, the 11th Annual Convention of The N. F. A. began the formation of a number of measures which, it is expected, will preserve for the industry the benefits of the past 2 years' operation under the Code.

C. T. MELVIN

Takes over the reins of the N.F.A. in a difficult period.

The operation of the Zoning Administrative machinery under the Code proved so effective that much thought was given to the retention of this feature through voluntary adherence to sectional groupings of this character, and through this machinery the Association is pinning its hopes for the future.

At the conclusion of the Convention, the board of directors elected as president of the Association C. T. Melvin, vice-president of Gulf Fertilizer, Tampa, to succeed John J. Watson, who has

* Official announcement was made early in July.

given such noteworthy services to the industry for the past 2 years.

Other officers elected were: vice-president, W. T. Wright, vice-president of F. S. Royster Guano, Norfolk, Va.; executive secretary and treasurer, Charles J. Brand.

With the Companies

A plan being formulated for the reorganization of Davison Chemical, the general terms of which have just been made public, represents the joint agreement of 3 committees representing various groups of holders of securities of the company and its subsidiaries.

Planning to operate under the name "Ohio Valley Reduction Co.," Paul Wallace and Jacob Bersch have organized a company to build and operate a new plant for the manufacture of fertilizer and tankage. Plant is to be situated on State Road No. 7 between Wirt and Dupont, near Madison, Ind.

Smith Agricultural Chemical Co. held a general sales meeting June 3 and 4.

George M. Keller resigns position with the State Chemical Laboratory at Auburn, Ala., to accept an appointment with Swift Fertilizer Works at Bartow.

International Trade in '34

World fertilizer trade, both domestic and international, was featured in '34, by more stable prices and a somewhat larger turnover which was due, at least in part, to Government encouragement to agriculturists, a world survey of the chemical industry just completed by the Bureau of Foreign and Domestic Commerce, Department of Commerce, shows.

A more complete recovery of the international fertilizer trade was hindered by the continuance of strong nationalistic tendencies in many nations which resulted in the extensive use of quota restrictions, embargos, exchange control, and other devices designed to foster the domestic production of fertilizers, either from natural sources or synthetically.

Industry Deaths

Jesse C. Adams, former V.-C. southeastern sales manager and connected with the company in various capacities for over 30 years, on June 21.

Valliant Retires

William E. Valliant is retiring from the presidency of Valliant Fertilizer, Laurel, Del., because of ill health, and is succeeded by J. W. Trought.

Del-Mar-Va Meeting

Nearly all of the business session of the Del-Mar-Va Peninsula Fertilizer Association's recent annual meeting was given over to discussion of the problem of how best to achieve stabilization without NRA.

Agricultural Chemicals

¶Insecticide Makers Will Meet in Cleveland—Boll Weevil Infestation Spotty—

The Agricultural Insecticide & Fungicide Association will hold its annual meeting at the Lake Shore Hotel, Cleveland, Aug. 7.

Boll Weevil Infestations

Boll weevil infestations—never distributed evenly throughout the Cotton Belt—seem to be more spotted than usual this year, according to Lee A. Strong, Chief of the Bureau of Entomology and Plant Quarantine, U. S. Dept. of Agriculture. Spotty infestations are reported from Texas to North Carolina.

Straight calcium arsenate, Mr. Strong says, is still the standard insecticide for the cotton boll weevil. Federal and State entomologists working on the problem of boll weevil control have found nothing better than this dust applied at the rate of 5 or 6 lbs. to the acre. Recent tests have shown, however, that in the Atlantic coastal region, calcium arsenate mixed half and half with lime also gives effective control.

Less Chinch Bugs

Heavy rains decreased chinch bug threat in the mid-west, according to Chief Entomologist Flint, Illinois Natural History Survey.

Sunland Suphur Buys

Sunland Sulphur, Fresno, Calif., purchases business of Argall Products Co. Both companies were organized in '31 to deal in insecticides.

Stanco enters the agricultural (garden) insecticide field with a new dust marketed in a novel package which is at once a container and sprayer.

Obituaries

William Langstaff, Sr.

William Langstaff, Sr., 71, prominent in chemical manufacturing circles and former Grasselli superintendent at the Linden, N. J., plant, on June 17. Born in England, he came to this country 50 years ago. Before his Linden assignment he was at the Cleveland and East Chicago plants.

Morris Trubek

Morris Trubek, 69, chemical industrialist, founder of Franco-American Chemical, large solvent, plasticizer, and special chemical producer at Carlstadt, N. J., on June 13. He was born in Riga, Russia, graduated from the University as a chemical engineer, and then set out for America. From a small beginning his Franco-American Chemical Works prospered and 12 years ago he completed the present modern plant. He retired from the company a few years ago and started the Trubek Laboratories in East Rutherford. Mr. Trubek was very prominent in social and civic work in Bergen County.

John W. O'Brien

John W. O'Brien, 56, general superintendent of operations for Grasselli and an outstanding production expert on industrial chemicals, on June 19, following an illness of 2 months. His first and only job was with Grasselli. By degrees he worked to the top, becoming general superintendent in '23 and a director in '28.

Other Deaths Last Month

W. J. Williams, 46, authority on sugar technology, on June 16 at Savannah. He spent much time in Cuba and the Dominican Republic.

Brigadier General P.D. Lochridge, 72, U. S. A. retired and for several years treasurer of the old shellac house of Marx & Rowalle, on June 17 at the Walter Reed Hospital in Washington.

Gilbert F. Oliver, for many years a vice-president of Ault & Wiborg and in charge of that company's activities in South America during most of the period, on June 19 in Cincinnati.

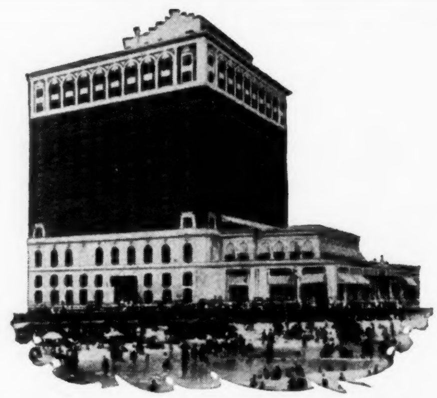
Harry Woolsey, 55, a vice-president of C. A. Woolsey Paint & Color, Jersey City, on June 19.

Garnet Lea, 50, founder, president and treasurer of Allied Asphalt & Mineral, suddenly on June 18 while playing in a golf foursome.

Edward S. Parks, 71, head of the Edward S. Parks Shellac Co., Fall River, Mass., on June 7. He had been in ill health for 4 months.

Stephane Frisard, 54, southern salesman for Rohm & Haas, on June 14.

Henry Louis Doyle, 51, chemist for Niagara Chlorine Products at Lockport, N. Y., on June 8.

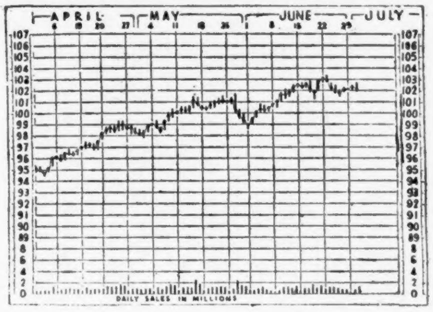


Chemical Finances

¶Stocks Advance For the Second Consecutive Month—Air Reduction Leads Chemical Group With Rise of 12⅛ Points—

Stocks' value rose in June by $1,678,306,714, the second month in succession of advances. Increase in May totalled $1,100,414,467. Value of all stocks listed

Daily Record of Stock Market Trend



—N. Y. Herald-Tribune

(1,184 issues) on the N. Y. Stock Exchange on July 1 was $36,227,069,618, as compared with $34,548,762,904 for 1,189 issues on June 1. Average price per share of all listed stocks on July 1 was $27.78. On June 1 the average price stood at $26.50.

The chemical group shared in the advance, the market value for the group on July 1 being reported at $4,301,009,996 against $4,009,492,294 on June 1, a net gain of $291,517,702 for the month. Average price for the chemical group on July 1 was $57.99; on June 1, $55.35; and on Jan. 1, $52.10.

Trading was heavy in the first 2 weeks of the month. The market displayed considerable strength, and while gains were irregular, the general trend was upward. In the last half of the month, however, and particularly in the last week, the market was dominated by the political situation in Washington. Uncertainty in business and financial circles over such measures as the enormously increased taxation proposal, the utility holding bill and the bank bill and the apparent determination of the Administration to force through these and other legislative enactments by the simple procedure of putting the Congress "on the spot" through record roll calls if necessary, brought about a decided reaction. The unexpected defeat of the President on the holding company measure in the first 2 days of July reversed this feeling and a modest rise followed.

Because of smaller payments in several groups, particularly in the bank, insurance, food and railroad classifications, which offset improvement in others, the aggregate of dividends declared in June was slightly less than a year ago and below the amount voted in May. Payments amounting to $255,346,504 were ordered by 1,250 corporations, compared with $328,858,312 for 776 companies in the previous month and $257,332,501 by 1,155 companies in June, 1934.

Monsanto Calls Bonds

At a meeting of the Monsanto board of directors on June 15 all outstanding 5½% bonds in the amount of $913,000, due in 1942, were called for payment and redemption on Aug. 20, 1935.

Board also authorized corporate action to be taken to purchase and redeem all outstanding preferred stocks of the Wilckes, Martin & Wilckes Co., the Provident Chemical Works and the Iliff-Bruff Chemical Co., the 3 companies being former subsidiaries of Swann.

Financial Notes

N. Y. Curb Exchange suspends dealings in Acetol Products, Inc., convertible A stock, as stockholders have approved dissolution of the company and distribution of its cash, its sole asset, at $9 a share for the convertible A stock.

Notices were sent to shareholders of Dewey & Almy Chemical inviting tenders of prior preference and preferred stock on or before July 1, '35. In November, '34, in response to an invitation for tenders the company repurchased 2559 shares of its preferred stock at an average price of $39.09.

Price Trend of Chemical Company Stocks

	May 31	June 7	June 14	June 22	June 29†	Net gain or loss last month	Price on June 30, 1934	1935 High	1935 Low
Air Reduction	129⅝	...	140	142½	142	+12⅜	98½	145⅛*	104⅜
Allied Chemical	145	149	153¾	153	153½	+ 8½	131	154¾*	125
Columbian Carbon	83½	85	92⅛	91	90	+ 6½	71½	93*	67
Com. Solvents	19⅛	19	19¾	19⅜	19½	+ ⅜	22¼	23⅞	17⅝
du Pont	97¼	98½	102⅞	104	101	+ 3¾	88⅝	104⅜*	86⅝
Hercules Powder	77	...	85¼	81	83⅝	+ 6⅝	72½	85¼*	71
Mathieson	28½	29	30	30	30	+ 1½	32¼	32	23¾
Monsanto	72¼	74	76	75	72½	+ ¼	51	77½*	55
Std. of N. J.	45¾	49⅛	48⅞	48⅜	45⅞	+ ⅛	43⅞	50½	35¾
Texas Gulf S.	33½	33½	35½	34⅝	33¾	+ ¼	34	36¾	28¾
Union Carbide	55½	59	61⅜	61⅞	60⅜	+ 4⅞	42¼	63¼*	44
U. S. I.	41	41	42⅞	43	42½	+ 1½	40¾	46¼	35⅛

* New highs in June; † Last day of trading.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs.	50c	June 18	July 1
Abbott Labs., ext. .	50c	June 18	July 1
Air Reduction, ext.	$1.00	June 29	July 15
Air Reduction ...	75c	June 29	July 15
Allied Chemical ...	$1.50	July 11	Aug. 1
Allied Chem., pfd.	$1.75	June 16	July 1
Amer. Agr. Chem.	50c	June 17	June 29
Amer. Cyan., A & B	10c	June 15	July 1
Amer. Smelt & Rfg., 6%, 2nd acc. ...	$6.00	Aug. 9	Sept. 2
Amer. Smelt & Rfg., 7%, 1st	$1.75	Aug. 9	Sept. 2
Bon Ami, Class A	$1.00	July 15	July 31
Bon Ami, Class B	50c	June 19	July 1
California Ink	50c	June 21	July 1
California Ink., ext.	25c	June 21	July 1
Canadian Celanese, 7%	$1.75	June 14	June 29
Canadian Indust. A	$1.00	June 29	July 31
Canadian Indust. A, ext.	75c	June 29	July 31
Canadian Indust. B	$1.00	June 29	July 31
Canadian Indust. B, ext.	75c	June 29	July 31
Canadian Indust., pfd.	$1.75	June 29	July 15
Celanese, 7%	$1.75	June 14	July 1
Celanese, 7% spec.	$3.50	June 14	June 30
Chickasha Cotton Oil, spec.	50c	June 14	July 1
Clorox Chem., ext.	12½c	June 20	July 1
Clorox Chemical. .	50c	June 20	July 1
Colgate-Palmolive-Peet, pfd.	$1.50	June 5	July 1
Com. Solvents ...	30c	June 1	June 29
Consol. Chem. Ind., A pfd.	37½c	July 15	Aug. 1
Devoe & Raynolds, ext.	25c	June 20	July 1
Devoe & Raynolds	25c	June 20	July 1
Devoe & Raynolds, 1st pfd.	$1.75	June 20	July 1
Devoe & Raynolds, 2nd pfd.	$1.75	June 20	July 1
du Pont, deb.	$1 50	July 10	July 25
Eastman Kodak ...	$1.25	June 5	July 1
Eastman Kodak, pfd.	$1.50	June 5	July 1
Freeport Texas, pfd.	$1.50	July 15	Aug. 1
Glidden, ext.	15c	June 17	July 1
Glidden	25c	June 17	July 1
Glidden, pr. pfd...	$1.75	June 17	July 1
Gold Dust	30c	July 10	Aug. 1
Gold Dust, 6% ..	$1.50	June 17	June 29
Great West. Electrochem.	$4.00	June 20	July 1
Great West. Electrochem., pfd. ..	$1.50	June 20	July 1
Hercules Powder, pfd.	$1.75	Aug. 2	Aug. 15
Heyden Chem., pfd.	$1.75	June 20	July 1
Industrial Rayon . .	42c	June 18	July 1
Int. Nickel	15c	May 31	June 29
Int. Nickel, pfd. ..	$1.75	July 2	Aug. 1
Int. Print. Ink ...	25c	June 15	Aug. 1
Int. Print. Ink., pfd.	$1.50	June 15	Aug. 1
Int. Salt	37½c	June 15	July 1
Koppers Gas & Coke	$1.50	June 12	July 1
Liquid Carbonic ..	25c	July 17	Aug. 1
Mathieson Alkali. .	37½c	June 11	July 1
Mathieson Alkali, pfd.	$1.75	June 11	July 1
Merck & Co.	10c	June 17	July 1
Merck & Co., pfd.	$2.00	June 17	July 1
Monroe Chem., pfd.	87½c	June 15	July 1
Mutual Chem., 6%	$1.50	Sept. 19	Sept. 28
Nat. Lead	$1.25	June 14	June 29
Nat. Lead, B	$1.50	July 19	Aug. 1
N. J. Zinc	50c	July 19	Aug. 10
North Amer. Ray., pr. pfd.	75c	June 27	July 1
North Amer. Ray., 7%	$1.75	June 27	July 1
Pittsburgh Plate Glass	50c	June 10	July 1
P. & G., 8%	$2.00	June 25	July 15
Sher. Williams Can., pf. acc.	$1.75	June 15	July 2
Solvay Am. Invest., 5½%	$1.37½	July 15	Aug. 15
Spencer Kellogg ..	40c	June 15	June 29
Union Carbide ...	40c	June 6	July 1
United Carbon ...	60c	June 15	July 1
United Dyewood, pfd.	$1.75	June 14	July 1
U. S. I.	50c	June 15	July 1
Vulcan Detinning, pfd.	$1.75	July 10	July 20
Vulcan Detinning, pfd.	$1.75	Oct. 10	Oct. 19
Westvaco Chlorine, pfd.	$1.75	June 15	July 1
Will & Baumer ..	10c	Aug. 1	Aug. 15
Will & Baumer, pfd.	$2.00	June 15	July 1

ANNUAL MEETINGS

	Record Date	Date of Meeting
Am. Com. Alcohol	July 1	July 22

Chemical Stocks and Bonds

Last	1935 June High	1935 June Low	1934 High	1934 Low	1933 High	1933 Low	Sales: Number of shares June 1935	Sales: Number of shares 1935	Stocks	Par $	Shares Listed	An. Rate*	Earnings $-per share-$ 1934	Earnings $-per share-$ 1933
NEW YORK STOCK EXCHANGE														
142	145⅛	104⅜	113	91¾	112	47½	13,300	77,400	Air Reduction	No	841,288	$4.50	4.98	3.79
153½	154¾	125	160¾	115⅛	152	70¾	36,700	136,500	Allied Chem. & Dye	No	2,214,099	6.00	6.83	5.50
125	127½	122½	130	122⅛	125	115	1,100	14,900	7% cum. pf.	100	345,540	7.00	50.79	42.24
47	57¾	41½	48	25¼	35	7¼	11,800	72,200	Amer. Agric. Chem.	100	315,701	2.00	.....	p4.19
25⅝	33¼	22½	62½	20¾	89⅞	13	21,900	117,600	Amer. Com. Alcohol	20	260,716	None	.....	4.56
41⅜	42¾	36	39⅛	26¼	29¼	9¾	7,800	49,500	Archer-Dan-Midland	No	541,546	1.50	.....	p3.82
40⅜	44½	32¾	55½	35¼	39⅛	9	6,000	56,000	Atlas Powder Co.	No	234,235	2.00	2.49	.74
112½	112½	106¾	106¾	83	83⅛	60	420	3,850	6% cum. pfd.	100	88,781	6.00	13.54	8.38
25¾	35⅜	19½	44⅞	17⅛	58⅞	4½	81,800	405,000	Celanese Corp. Amer.	No	987,800	None	1.25	3.32
16⅝	18¼	15⅛	18⅛	9½	22⅜	7	43,900	200,400	Colgate-Palm.-Peet	No	1,985,812	.75	1.16	— .57
104	105½	101	102½	68½	88	49	2,300	13,400	6% pfd.	100	254,500	6.00	15.14	1.51
90	93	67	77¼	58	71½	23⅛	28,900	127,500	Columbian Carbon	No	538,154	3.40	3.93	2.17
19½	23⅞	17⅝	36¾	15¾	57¼	9	92,500	645,500	Commer. Solvents	No	2,635,371	.85	.89	.88
75	76¾	62	84½	55½	90⅝	45⅛	37,200	159,300	Corn Products	25	2,530,000	3.00	3.16	3.87
164	165	149	150½	135	145¼	117½	300	4,400	7% cum. pfd.	100	243,739	7.00	39.65	46.02
39	50⅜	36	55¼	29	33⅞	10	2,100	9,600	Devoe & Rayn. A	No	95,000	2.00	2.36	3.82
101	105⅛	86⅝	103⅞	80	95⅞	32⅛	117,900	488,900	DuPont de Nemours	20	10,871,997	3.15	3.63	2.93
129⅛	131	126⅞	128½	115	117	97½	2,800	18,000	6% cum. deb.	100	1,092,699	6.00	42.73	35.58
146¾	149¼	110½	116½	79	89¾	46	29,000	129,000	Eastman Kodak	No	2,250,921	4.00	6.28	4.76
157	161½	141	147	120	130	110	570	3,810	6% cum. pfd.	100	61,657	6.00	235.22	180.34
24¾	28½	17¼	50⅜	21½	49⅜	16⅛	28,600	141,200	Freeport Texas	10	784,664	2.00	1.76	3.01
112½	120⅛	112½	160⅛	113½	160⅛	97	300	1,500	6% conv. pfd.	100	25,000	6.00	120.08	156.73
30⅛	32	23⅜	28⅜	15⅝	20	3¾	37,900	131,500	Glidden Co.	No	603,304	.90	.....	1.54
109	109⅜	104⅞	107½	83	91½	48	1,010	4,430	Glidden, 6% pfd.	100	63,044	7.00	.....	22.60
105½	111	85	96⅞	74	85⅞	65	6,400	32,400	Hazel Atlas	25	434,409	5.00	5.21	6.22
83⅝	85¼	71	81⅝	59	68⅝	15	8,700	34,800	Hercules Powder	No	582,679	3.00	3.94	2.79
122½	128	122	125¾	111	110⅛	85	590	2,610	7% cum. pfd.	100	105,765	7.00	28.79	22.38
27½	33	23½	32	19⅜	85	24	27,600	247,300	Industrial Rayon	No	600,000	1.68	2.23	3.01
3¼	5	2¾	6⅛	2	5⅞	⅞	14,900	58,600	Interr.. Agricul.	No	436,049	None	.....	p .69
33	42¾	26	37¼	15	23½	5	2,200	19,700	7% cum. pr. pfd.	100	100,000	None	.....	p4.00
27½	29⅜	22¼	29¼	21	23¼	6¾	172,300	913,800	Intern. Nickel	No	14,584,025	.60	1.14	.53
34½	36¼	29	32	21	27¾	13¼	2,400	11,800	Intern. Salt	No	240,000	1.50	2.02	2.04
35⅛	36¼	32	33⅛	15¾	22	7½	4,800	26,700	Kellogg (Spencer)	No	500,000	1.60	.....	v3.01
29¾	32¾	21½	43⅞	22½	37⅜	4⅛	91,400	377,800	Libbey Owens Ford	No	2,559,042	1.20	1.25	1.64
31¼	32⅝	24½	35⅜	16⅛	50	10¼	18,600	92,600	Liquid Carbonic	No	342,406	1.25	.....	v1.05
30	32	23¼	40¾	23½	46⅝	14	28,100	136,300	Mathieson Alkali	No	650,436	1.50	1.20	1.70
72½	77½	55	61⅝	39	83	25	17,700	86,500	Monsanto Chem.	10	864,000	1.25	3.03	2.57
172	175¼	145	170	135	140	43¼	1,600	10,200	National Lead	100	309,831	5.00	8.38	6.98
161	162½	150	146½	122	128¼	101	900	2,840	7% cum. "A" pfd	100	243,676	7.00	20.12	18.35
136	138½	121⅝	121½	100½	109⅛	75	640	2,250	6% cum. "B" pfd.	100	103,277	6.00	35.36	30.45
5⅞	8	4⅜	13	5½	11¾	1⅜	5,700	43,800	Newport Industries	1	519,347	None	.31	.05
99	104	80	94	60	96¾	31½	21,300	78,600	Owens-Illinois Glass	25	1,200,000	4.00	5.41	4.86
49¼	50⅞	42⅜	44⅜	33⅛	47½	19⅝	38,400	200,100	Procter & Gamble	No	6,410,000	1.70	.....	p 2.11
119	120¾	115	117	102½	110¾	97	570	3,580	5% pfd. (ser. 2-1-29)	100	171,569	5.00	.....	p73.15
4⅛	5½	4	6¾	3⅛	7¼	1⅜	8,700	52,800	Tenn. Corp.	5	857,896	None	.27	— .11
34¼	36¾	28¾	43¼	30	45¼	15¼	40,000	238,500	Texas Gulf Sulphur	No	2,540,000	2.00	1.81	2.93
61¼	63¼	44	50⅞	35⅞	51⅞	19¼	157,900	633,200	Union Carbide & Carbon	No	9,000,743	1.60	2.28	1.59
58⅛	60¾	46	50⅜	35	37¾	10¼	24,100	135,200	United Carbon	No	370,127	2.40	3.55	1.39
42½	46¼	35⅛	64¾	32	94	13½	31,300	137,600	U. S. Indus. Alco.	No	391,033	None	4.04	3.56
13¾	21¾	11¼	31¼	14	36¼	7⅝	16,100	121,200	Vanadium Corp.-Amer.	No	366,637	None	—2.29	—2.40
3	4⅝	2½	5⅜	1⅞	7⅜	⅝	6,800	52,000	Virginia-Caro. Chem.	No	486,000	None	.....	p—2.46
22	27¼	17½	26	10	26½	3⅜	10,800	78,500	6% cum. part. pfd.	100	213,392	None	.....	p .52
104	104	85	84	59¼	63½	35⅜	1,100	5,200	7% cum. prior pfd.	100	60,000	None	.....	p9.06
20	23½	16¾	27¼	14⅞	20½	5	6,700	34,000	Westvaco Chlorine	No	284,962	.40	1.55	1.08
NEW YORK CURB EXCHANGE														
21½	22⅜	15	22½	14⅝	16½	3¼	113,900	391,100	Amer. Cyanamid "B"	No	2,404,194	m .10	.99	.99
3⅞	4	2	4⅛	2⅜	4½	1	4,500	8,500	British Celanese Am. R.	243	....	None	.....	.....
100	110	90	105¼	81	110	27	1,550	14,425	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	16.37	32.24
104	105	97½	102	83	90	51	400	3,475	7% cum. prior pfd.	100	113,668	7.00	28.13	47.98
8¼	15	8	19	7	26⅞	2	125	4,700	Celluloid Corp.	15	194,952	None	—1.67	—1.00
12½	12½	11⅝	14⅜	10½	11⅝	4⅛	100	6,500	Courtaulds' Ltd.	1 £	24,000,000	4½%	.....	.....
101½	102½	80½	91	67½	78	30	8,400	41,800	Dow Chemical	No	945,000	2.00	.....	†3.60
9	12½	8	10¾	4	8	½	8,500	31,900	Duval Texas Sulphur	No	500,000	None	.....	z .08
50	52½	37	40¾	19	19	8	1,700	12,400	Heyden Chem. Corp.	10	147,600	1.35	3.07	2.74
66¾	67¾	46¾	57½	39	39⅞	13	19,300	74,400	Pittsburgh Plate Glass	25	2,141,305	1.40	2.69	1.87
100	100½	84	90½	47¼	47	12⅞	8,560	55,860	Sherwin Williams	25	635,583	3.00	.....	y3.54
108⅞	113½	108	109¾	100	99	80	90	2,510	6% pfd. AA. cum.	100	155,521	6.00	.....	y20.78
PHILADELPHIA STOCK EXCHANGE														
95	96½	70	75	50¼	57	25¼	700	2,684	Pennsylvania Salt	50	150,000	4.00	.....	p5.07

Last	1935 June High	1935 June Low	1934 High	1934 Low	1933 High	1933 Low	Sales June 1935	Sales 1935	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE													
110¼	111	104½	106¾	83⅞	89	64	599,000	2,923,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
11⅝	11⅝	7⅜	17¾	5	14⅛	2⅛	91,000	598,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
83¼	87½	77⅜	88	61½	74⅞	37	15,000	370,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
98¾	99¾	91⅛	92	62	65	38½	209,000	1,147,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
10¾	10¾	7	19½	5⅛	14⅞	2½	734,000	2,615,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
88½	97	87⅛	98½	89⅞	99⅛	87	134,000	472,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
36	38	35	74½	34½	62	33¾	......	13,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
101	102	91½	90	65½	76	50	97,000	250,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
78¼	94¼	66	89½	62	81	34¾	111,000	1,154,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE													
101¼	104	101¼	104⅝	101⅛	103½	101	.....	62,000	Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

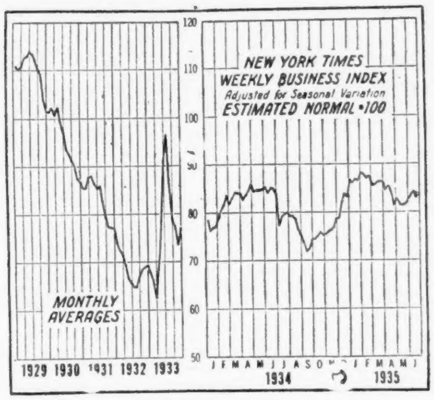
† Year ended 5-31-34; m Last paid, no regular rate; p Year ended 6-30-34; v Year ended 9-1-34; y Year ended 8-31-34; z Year ended 8-31-34;
* Including extras.

Industrial Trends

¶ *June Volume of Business Satisfactory — Retail Trade and Automotive Production Bright Spots—*

Business recovered sharply in the first week of June from the momentary halt which followed the Supreme Court's decision on NRA. Despite the staggering new tax proposals of the Administration,

Trend of Business Activity



designed to help pay for the towering debt load, and other measures, such as the bank bill, the Wagner labor bill, the utility holding bill, etc., business continued to hold at fairly satisfactory seasonal levels for the first 3 weeks, but in the final week lost ground rapidly, largely due to the decline in bituminous coal output. Soft coal mining was in heavy volume for the first few weeks of the month when the producers were fearful of serious strike disturbances. Intervention of the President obtained a 30-day truce which will enable Congress to pass the Guffey coal stabilization bill, which with its price-control provision, many operators contend will enable the industry to make new wage and hour commitments. In the last week there was a falling off in steel operations and railroad loadings.

Retail Trade Holds Gains

Retail trade remains very satisfactory, approximately 5 to 20% ahead of the corresponding period of last year. Wholesale trade, too, is in good volume. In the 3rd week electrical production came close to the high weekly total for the year to date, reached in January, and was ahead for any week in June on record. It was the 3rd successive week in which records were broken.

Steel activity in the last week was at a rate of 37.7%, which compares unfavorably with a month ago when the rate was 42.3% and the same period a year ago when the rate was 44.7%. Automotive centers continue as a bright spot. July production is expected to reach 300,000 units. This would compare with 277,000 in July of last year, a net gain of about 8%. Process industries are far from being in complete accord on business conditions. The leather, tanning, paper, rubber, and glass fields are active. Paint production is slackening seasonally, but sales are far ahead of last year. Textile demand, on the other hand, is still very discouraging. Most of the cotton mills agreed to close for the first week of July. A number of others resorted to single shifts. Finishing and dyeing plans are operating at very low levels.

Rate of Business Activity

The N. Y. Times Index of Business Activity on June 22 stood at 83.0 compared to 81.6 on May 25, but on June 15 the index was at 84.3 and on June 23, '34 at 84.8. Commodity prices generally lost ground last month as the various indices shown below quite plainly indicate.

After NRA

Reports from business in June were on the whole reassuring. Fears that the upsetting of NRA would lead to price and wage disturbances seem to have been allayed. In the fertilizer industry, however, the ancient curse of severe price competition again was in evidence and a great deal of pessimism is prevalent within that particular field.

Building Gains

Building is showing signs of awakening but the improvement is still painfully slow. Many executives feel that further substantial business recovery will not take place until the spring or summer of next year because of the failure of the PWA program to get started and because the durable goods industries are still lagging behind. Yet certain signs of continued improvement cannot be ignored. Travel is the heaviest since 1929. People are spending as they have not done in 5 years. Most business leaders are agreed that if Congress only stood adjourned, the political situation in Washington cleared and many of the more radical bills defeated, that further substantial gains would be certain in the last 6 months of the year.

Statistics of Business

	May 1935	May 1934	April 1935	April 1934	March 1935	March 1934
Automotive production	364,721	330,455	447,546	371,338	451, 805	345,443
Bldg. contracts*‡	$126,718	$134,363	$124,000	$131,157	$123,043	$179,161
Failures, Dun & Bradstreet	1,027	977	1,115	1,052	976	1,102
Merchandise imports‡	$170,559	$154,647	$170,567	$146,523	$177,279	$152,288
Merchandise exports‡	$165,457	$160,197	$164,350	$179,427	$185,001	$160,312
Newsprint Production						
Canada, tons	242,693	242,539	222,244	216,508	205,682	210,129
U. S., tons	84,323	89,726	74,891	83,652	73,528	84,993
Newfoundland, tons	29,658	28,148	26,288	25,311	28,393	24,778
Mexico, tons	846	1,666	1,337	1,616	1,992	1,287
Total, tons	357,520	362,079	324,760	327,086	309,595	321,187
Plate Glass prod, sq. ft. ...	14,581,557	7,764,477	16,998,914	......	......	9,926,859
Steel ingots production ...	2,602,054	3,352,788	2,606,311	2,897,808	2,830,700	2,761,438
Steel activity, % capacity..	43.53	56.40	45.28	52.64	49.18	46.45
Pig iron production	1,727,095	2,042,896	1,663,475	1,726,851	1,770,000	1,619,534
U. S. consumption, crude rubber, tons	41,568	42,918	44,714	44,853	42,620	47,097
Tire shipments	......	......	5,143,599	4,438,378	4,204,131	4,222,962
Tire production	......	......	4,511,635	4,769,980	4,345 581	5,180,122
Tire inventory	......	......	11,003,237	11,980,732	11,675,268	11,650,661
Dept. of Labor Indices						
Factory payrolls, totals† ..	68.5	67.1	70.8	67.3	70.8	64.8
Factory employment† ...	81.3	82.6	82.3	82.3	82 4	80.8
Chemical price index† ...	......	......	87.2	78.6	88.1	79.0
Chemical employment†*a* ..	......	......	112.3	110.8	113.9	113.4
Chemical payrolls†*a*	......	......	95.5	95.8	96.0	88.3
Chemicals and Related Products						
Exports‡	......	......	......	$7,840	$9,077	$8,848
Imports‡	......	......	......	$8,509	$6,099	$7,366
Stocks, mfd. goods†	......	117	119	123	118	126
Stocks, raw materials† ..	......	94	87	96	91	101
Cement prod., ratio of prod. to capacity	36 1	37.5	27.9	......	18.9	......
Anthracite prod., tons	4,346,863	4,491,418	4,168,364	4,173,110	......	......
Bituminous prod., tons	26,790,000	27,385,000	21,920,000	......	......	......

Week Ending	Carloadings 1935	Carloadings 1934	Carloadings % of Change	Electrical Output§ 1935	Electrical Output§ 1934	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices: Fats & Oils	Chem. & Drugs	Mixed Fert.	Fert. Mat.	All Groups	Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
May 25....	599,543	625,990	—4.4	1,696,051	1,654,903	+2.5	79.8	83.0	70.8	94.4	76.3	65.3	78.4	42.3	81.6	120.9
June 1....	565,342	579,656	—2.5	1,628,520	1,575,828	+3.3	79.0	68.6	94.4	76.3	65.1	78.0	80.8	39 5	83.6	121.5
June 7....	630,836	616,768	+2.3	1,724,491	1,654,916	+4.2	79.6	68.6	94 4	76.3	65.1	77.9	80.7	39.0	83.9	121.5
June 15....	653,092	618,881	+5.5	1,742,506	1,665,358	+4.6	78.2	67.9	94.4	77.7	65.0	77.8	80.4	38.3	84.3	121.6
June 22....	567,847	623,322	—8.9	1,774,654	1,674,566	+6.0	77.5	67.4	94.4	77.7	64.8	77.5	80.2	37.7	83.0	122.0
June 29....	618,036	646,003	—4.3	....	....	....	77.7	65.6	94.6	77.7	64.4	...	80.0	32.8	83.4	122.6

* 37 states, F. W. Dodge Corp.; ‡ 000 omitted; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; *a* Includes all allied products but not petroleum refining; § k.w.h., 000 omitted.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizers and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1934 Average $1.31 - Jan. 1935 $1.23 - June 1935 $1.22

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Acetaldehyde, drs c-l, wks lb.	...	.14	...	.14	.14	.16½
Acetaldol, 95%, 50 gal drs wks ....lb.	.21	.25	.21	.25	.21	.31
Acetamide, tech, lcl, kegs..lb.	.38	.43	.38	.43	.40	1.35
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys ....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech, drs ....lb.	.22	.24	.22	.24	.22	.32
Acetone, tks, delv ....lb.	.11	.12	.11	.12	.10	.12
drs, c-l, delv ....lb.	...	.12	...	.12	.12	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls ....lb.	.06¾	.07	.06¾	.07	.06	.07
Acetic, 28%, 400 lb bbls, c-l, wks ....100 lbs.	...	2.45	2.40	2.45	2.40	2.91
glacial, bbls, c-l, wks 100 lbs.	...	8.43	8.25	8.43	8.25	10.02
glacial, USP, bbls, c-l, wks ....100 lbs.	...	12.43	12.25	12.43	...	12.25
Adipic, kgs, bbls ....lb.	...	.72	...	.72	.72	.72
Anthranilic, refd, bbls ....lb.	.85	.95	.85	.95	.85	.95
tech, bbls ....lb.	...	.75	...	.75	.65	.75
Battery, cbys, delv ..100 lbs.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb kgs ..lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs ....lb.	.54	.59	.54	.59	...	...
Boric, tech, gran, 80 tons, bgs, delv ....ton *a*	...	95.00	80.00	95.00	80.00	80.00
Broenner's, bbls ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 95%, cbys ....lb.	.53	.60	.53	.60	.53	.85
edible, c-l, wks, cbys ...lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs ....lb.	...	.22	...	.22	.22	.22
wks ....lb.	...	.23	...	.23	.23	.23
tks, wks ....lb.	...	.21	...	.21	.21	.21
Camphoric, drs ....lb.	...	5.25	...	5.25	5.25	5.25
Chicago, bbls. ....lb.	...	2.10	...	2.10	2.10	2.10
Chlorosulfonic, 1500 lb drs, wks ....lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99¼%, drs, delv lb.	.13¾	.15¾	.13¾	.15¾	.13½	.15¾
Citric, USP, crys, 230 lb bbls ....lb. *b*	.28	.29	.28	.29	.28	.30
anhyd, gran, drs ....lb. *b*	...	.31	...	.31	.31	.31
Cleve's, 250 lb bbls ....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal.	.45	.47	.46	.48	.46	.47
99%, straw, LB, drs, wks, frt equal ....gal.	.64	.65	.64	.65	.64	.65
resin grade, drs, wks, frt equal ....gal.	.54	.55	.54	.55	.54	.55
Crotonic, drs ....lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs ..lb.	.11	.13	.11	.13	.11	.13
Fumaric, bbls ....lb.	...	.60	...	.60	...	...
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs. ....lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls ....lb.	.65	.68	.65	.68	.60	.70
USP, bbls ....lb.	.70	.80	.70	.80	.74	.80
Gamma, 225 lb bbls, wks...lb.	.77	.79	.77	.79	.77	.79
H, 225 lb. bbls, wks ....lb.	.50	.55	.50	.55	.50	.70
Hydriodic, USP, 10% sol. cbys ....lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks ....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks ....lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks ....lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks ....lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls ....lb.	.04½	.05	.04½	.05	.04	.05
22%, light refd, bbls ..lb.	.06½	.07	.06½	.07	.06½	.07
44%, light, 500 lb bbls ..lb.	.11½	.12	.11½	.12	.11½	.12
44%, dark, 500 lb bbls ..lb.	.09½	.10	.09½	.10	.09	.10
USP X, 95%, cbys ....lb.	.45	.50	.45	.50	...	...
USP VIII, 75%, cbys ..lb.	.43	.48	.43	.48	...	...
Laurent's, 250 lb bbls ....lb.	.36	.37	.36	.37	.36	.37
Linoleic, bbls ....lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs ....lb.	.29	.32	.29	.32	.25	.32
Malic, powd, kgs ....lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks ....N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.01
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls ....lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Muriatic, 18°, 120 lb cbys, c-l, wks ....100 lb.	...	1.35	...	1.35	...	1.35
tks, wks ....100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks ..100 lb.	...	1.45	...	1.45	...	1.45
tks, wks ....100 lb.	...	1.20	...	1.20	...	1.20
22°, c-l, cbys, wks ..100 lb.	...	1.95	...	1.95	...	1.95
tks, wks ....100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys ....lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls ....lb.	.85	.87	.85	.87	.85	.87
Naphthenic, drs ....lb.	.12	.13	.12	.13	.10	.13
Naphthionic, tech, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys. c-l, wks ....100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks..100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks..100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks..100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Phosphoric, 50%, USP, cbys ....lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks..lb.	.06	.08	.06	.08	.05	.08
75%, acid, c-l, drs, wks..lb.	.09	.10½	.09	.10½	.07	.10½
Picramic, 300 lb bbls, wks.lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks ....lb.	.30	.40	.30	.40	.30	.50
Propionic, 98% wks, drs..lb.	...	.35	...	.35	...	...
80% ....lb.	.15	.17½	.15	.17½	...	...
Pyrogallic, crys, kgs, wks..lb.	1.55	1.65	1.55	1.65	1.40	1.65
Salicylic, tech, 125 lb bbls, wks ....lb.	...	.40	...	.40	.33	.40
Sebacic, tech, drs, wks ....lb.	...	.58	...	.58	...	.58
Succinc, bbls ....lb.	...	.75	...	.75	...	...
Sulfanilic, 250 lb bbls, wks lb.	.18	.19	.18	.19	.18	.19
Sulfuric, 60°, tks, wks .. ton	...	11.00	...	11.00	...	11.00
c-l, cbys, wks ....100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks ....ton	...	15.50	...	15.50	15.00	15.50
c-l, cbys, wks ....100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks ....lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ....ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls ....lb.	...	.24	.24	.25	.25	.26
Tobias, 250 lb bbls....lb.	.75	.80	.75	.80	.75	.80
Trichloroacetic bottles....lb.	2.45	2.75	2.45	2.75	2.00	2.75
kgs ....lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls ....lb.	1.50	1.60	1.50	1.60	1.35	1.70
Vanadic, drs, wks ....lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls ....lb.	.45	.53	.45	.53	.35	.53
dark, bbls ....lb.	.12	.17	.12	.17	.10	.17
egg, edible ....lb.	...	1.05	.85	1.05	.82	.92
vegetable, edible ....lb.	.65	.70	.65	.70	.65	.70
ALCOHOLS						
Alcohol, Amyl, tks, delv...lb.	...	.143	...	.143	...	.143
c-l, drs, delv ....lb.	...	.15	...	.15	.15	.157
Amyl, secondary, tks, delv ....lb.	...	.108	...	.108	...	.108
c-l, drs, delv ....lb.	...	.118	...	.118	...	.118
Amyl, tertiary, tks, delv lb.	...	.052	.052	.072	...	.052
c-l, drs, delv ....lb.	...	.062	.062	.082	...	.062
Benzyl, bottles ....lb.	.65	1.10	.65	1.10	.75	1.10
Butyl, normal, tks, delv .lb. *d*	...	.12	...	.12	.09½	.12
c-l, drs, delv ....lb. *d*	...	.13	...	.13	.10½	.13
Butyl, secondary, tks, delv ....lb. *d*	...	.096	...	.096	.076	.096
c-l, drs, delv ....lb. *d*	...	.106	...	.106	.086	1.06
Capryl, drs, tech, wks ..lb.	...	.85	...	.85	.85	.85
Cinnamic, bottles ....lb.	3.25	3.65	3.25	3.65	3.25	3.65
Denatured, No. 5, c-l, drs, wks ....gal. *e*	...	.35½	.34	.35½	.30	.34
Western schedule, c-l, wks ....gal. *e*	...	.39½	.38	.39½	...	...
Denatured, No. 1, tks, wks ....gal. *e*	...	.31	.29½	.31	.29½	.304
c-l, drs, wks ....gal. *e*	...	.36	.34½	.36	...	...
Western schedule, tks, wks ....gal. *e*	...	.35	.32½	.35	...	...
c-l, drs, wks ....gal. *e*	...	.40	.37½	.40	...	...
Diacetone, tech, tks, delv ....lb. *f*	...	.16	...	.16	...	...
c-l, drs, delv ....lb. *f*	...	.17	...	.17	...	.17

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Alcohols (continued)						
Ethyl, 190 proof, molasses, tks ....gal. *g*	...	4.10	4.08½	4.10	...	4.08½
c-l, drs ....gal. *g*	4.17	4.27	4.13½	4.27	...	4.13½
c-l, bbls ....gal. *g*	4.18	4.28	4.15½	4.28	4.12½	4.24½
absolute, drs ....gal. *g*	4.57½	6.11½	4.55½	6.11½	...	...
Furfuryl, tech, 500 lb, drs ....lb.	...	.35	...	.35	.35	.40
Hexyl, secondary tks, delv lb.	...	.11½	...	.11½	...	.11½
c-l, drs, delv ....lb.	...	.12½	...	.12½	...	.12½
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	4.00	4.50	4.00	4.50	4.00	4.50
Isobutyl, refd, lcl, drs ..lb.	...	.12	.12	.60	.60	.75
c-l, drs ....lb.	...	.11½	...	...	...	...
tks ....lb.	...	.10½	...	...	...	...
Isopropyl, refd, c-l, drs..lb.	...	.55	...	.55	.45	.55
Propyl, norm, 50 gal drs gal.	...	.75	...	.75	...	.75
Special Solvent, tks, wks gal.	...	.32	...	...	...	...
Western points, tks, wks ....gal.	...	.35	...	...	...	...
Aldehyde ammonia, 100 gal drs ....lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb bbls ....lb.	.60	.65	.60	.65	.65	.70
Alphanaphthylamine, 350 lb bbls ....lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.00	...	3.00	2.90	3.00
25 bbls or more, wks ....100 lb.	...	3.15	...	3.15	...	3.15
less than 25 bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Granular, c-l, bbls, wks 100 lb.	...	2.75	...	2.75	...	2.75
25 bbls or more, wks 100 lb.	...	2.90	...	2.90	...	2.90
Powd, c-l, bbls, wks 100 lb.	...	3.15	...	3.15	...	3.15
25 bbls or more, wks 100 lb.	...	3.30	...	3.30	...	3.30
Chrome, bbls ....100 lb.	7.00	7.25	7.00	7.25	6.50	7.25
Potash, lump, c-l, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
25 bbls or more, wks 100 lb.	...	3.40	...	3.40	...	3.40
Granular, c-l, bbls, wks 100 lb.	...	3.40	...	3.00	...	3.00
25 bbls or more, bbls, wks ....100 lb.	...	3.00	...	3.15	...	3.15
Powd, c-l, bbls, wks 100 lb.	...	3.40	...	3.40	...	3.40
25 bbls or more, wks 100 lb.	..	3.55	...	3.55	...	3.55
Soda, bbls, wks ....100 lb.	4.00	4.15	4.00	4.15	3.50	4.15
Aluminum metal, c-l NY ....100 lb.	20.00	23.30	20.00	23.30	20.00	24.30
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%, wks ....lb.	.07	.12	.07	.12	.07	.12
93%, wks ....lb.	.05	.08	.05	.08	.04	.08
Crystals, c-l, drs, wks ...lb.	.06½	.07	.06½	.07	.06½	.01
Solution, drs, wks ....lb.	.03	.03½	.03	.03½	.03	.03½
Hydrate, 96%, light, 90 lb. bbls, delv ....lb.	.13	.15	.13	.15	.13	.16½
heavy, bbls, wks ....lb.	.04	.04½	.04	.04½	.04	.04½
Oleate, drs ....lb.	...	.15¼	...	.15¼	...	.15¼
Palmitate, bbls ....lb.	.21	.22	.20	.22	.19	.21
Resinate, pp., bbls ....lb.	...	.15	...	.15	.12½	.15
Stearate, 100 lb bbls....lb.	.18	.20	.17	.20	.17	.18
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.35	...	1.35	1.35	1.35
c-l, bbls, wks ....100 lb.	...	1.55	...	1.55	1.55	1.55
Sulfate, iron-free, c-l, bgs, wks ....100 lb.	...	1.90	...	1.90	1.90	1.90
c-l, bbls, wks ....100 lb.	...	2.05	...	2.05	2.05	2.05
Aminoazobenzene, 110 lb kgs ....lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks..lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.21½	.15¼	.21½	.15¼	.21½
26°, 800 lb drs, delv ....lb.	.02½	.03	.02½	.03	.02½	.03
Aqua 26° tks NH ....cont.	...	.05	...	.05	...	.05
tk wagon ....lb.	...	.024	...	.024	...	...
Ammonium Acetate, kgs ..lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b. plant ....100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls...lb.	.15	.17	.15	.17	.15	.17
carbonate, tech, 500 lb bbls ....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb bbls, wks ....100 lb	4.45	4.90	4.45	4.90	4.45	5.25
Gray, 250 lb bbls wks...lb.	5.00	5.75	5.00	5.75	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10	.11
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Linoleate ....lb.	.11	.12	.11	.12	.11	.12
Nitrate, tech, cks ....lb.	.04	.05	.04	.05	.03¾	.05
Oleate, drs ....lb.	...	.10	...	.10	...	.10
Oxalate, neut, cryst, powd, bbls ....lb.	.26	.27	.26	.27	.26	.27
pure, cryst, bbls, kgs..lb.	.27	.28	.27	.28	.27	.28
Serchlorate, kgs ....lb.	...	.16	...	.16	.16	.16
Persulfate, 112 lb kgs ..lb.	.22½	.25	.22½	.25	.20	.25
Phosphate, dibasic tech, powd, 325 lb bbls ....lb.	.08	.10	.08	.10	.08	.11½
Sulfate, dom, f.o.b., bulk.ton	...	23.50	23.50	24.00	22.00	25.00
200 lb bgs ....ton	...	25.30	25.50	25.80	...	25.80
100 lb bgs ....lb.	...	26.00	26.00	26.50	...	26.50
Sulfocyanide, kgs ....lb.	...	.50	...	.50	...	.50
Amyl Acetate (from pentane) tks delv ....lb.	...	.13½	...	.13½	...	.13½
tech, drs, delv ....lb.	.142	.149	.142	.149	.142	.149
secondary, tks, delv ..lb.	...	.108	...	.108	.09	.108
c-l, drs, delv ....lb.	.118	.123	.118	.123	...	.123
Alcohol, see Alcohol, Amyl, also Fusel Oil.						

g Grain alcohol 20c a gal. higher in each case.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Amyl Chloride, norm drs, wks lb.	.56	.68	.56	.68	.56	.68
Chloride, mixed, drs, wks ....lb.	.07	.077	.07	.077	.07	12.2
tks, wks ....lb.	...	.06	...	.06	.06	10.5
Lactate, drs, wks ....lb.	...	.50	...	.50	...	.50
Mercaptan, drs, wks ....lb.	...	1.10	...	1.10	...	1.10
Stearate, drs, wks ....lb.	...	.31	...	.31	...	.31
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.10	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine ....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% ....lb.	...	.75	...	.75	...	.75
40% ....lb.	...	.18	...	.18	...	.18
Anthraqumone, sublimed, 125 lb bbls ....lb.	.50	.52	.50	.52	.45	.50
Antimony, metal slabs, ton lots ....lb.	.12¾	.14¼	.12¾	.15	.07	.14½
Needle, powd, bbls ....lb.	.11½	.13½	.09	.13½	.07	.09
Butter of, see Chloride.						
Chloride, soln cbys ....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls ....lb.	.11	.13	.10¼	.13	.08	.11
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.22	.24
Sulfuret, golden, bbls ...lb.	.22	.23	.19	.23	.16	.23
Vermilion, bbls ....lb.	.35	.42	.35	.42	.35	.42
Archil, conc, 600 lb bbls ..lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Triple, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Arglos, 80%, casks ....lb.	.15	.16	.15	.16	.15	.16
Crude, 30%, casks ....lb.	.07	.08	.07	.08	.07	.09
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl ....lb.	.08¾	.09¾	.08¾	.09¾	.08¾	.09¼
Arsenic, Red, 224 lb cs kgs lb.	...	.15¾	...	.15¾	.14	.15¾
White, 112 lb kgs ....lb.	.03½	.04½	.03½	.04½	.03½	.05
Metal ....lb.	.40	.42	.40	.42	.40	.45
Asbestine, c-l wks ....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate precip, 200 lb bgs, wks ....ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat (witherite) 90% gr, c-l, wks, bgs ....ton	42.00	45.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs NY lb.	.15½	.17½	.14	.17½	.14	.16
Chloride, 600 lb bbl wks ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.13
Hydrate, 500 lb bbls ....lb.	.05½	.06	.05½	.06	.04¾	.06
Nitrate, 700 lb cks ....lb.	...	.08¼	...	.08¼	...	.08¼
Barytes, floated, 350 lb bbls wks ....ton	23.65	31.15	23.00	31.15	23.00	30.50
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	5.00	10.00
Benzaldehyde, tech, 945 lb drs, wks ....lb.	.60	.62	.60	.62	.60	.65
Benzene (Benzol), 90%, Ind, 8000 gal tks, frt allowed ....gal.	...	.15	...	.15	.15	.20½
90% c-l, drs ....gal.	...	.24	...	.24	...	.24
Ind Pure, tks, frt allowed ....gal.	...	.15	...	.15	.15	.20½
Benzidine Base, dry, 250 lb bbls ....lb.	.67	.69	.67	.69	.67	.69
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs..lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl, wks ....lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.53	.55	.53	.55	.53	.58
Bismuth metal	1.10	1.20	1.10	1.20	1.10	1.30
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	...	...
Hydroxide, boxes ....lb.	3.15	3.20	3.15	3.20	...	...
Oxychloride, boxes ....lb.	2.95	3.00	2.95	3.00	...	...
Subbenzoate, boxes ....lb.	3.25	3.30	3.25	3.30	...	...
Subcarbonate, kgs ....lb.	1.55	1.65	1.55	1.70	...	...
Trioxide, powd, boxes ..lb.	3.45	3.50	3.45	3.50	...	...
Subnitrate	1.40	1.45	1.40	1.45	1.40	1.60
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks ....ton *h*	42.50	70.00	42.50	70.00	42.50	70.00
Bleaching Powder, 800 lb drs c-l wks contract...100 lb.	...	1.90	...	1.90	...	1.90
lcl, drs, wks ....lb.	2.15	3.50	2.15	3.50	2.00	3.50
Blood, dried, f.o.b., NY..unit	...	2.90	2.75	3.25	2.40	3.25
Chicago, high grade ...unit	...	2.85	2.75	3.75	2.00	3.10
Imported shipt ....unit	...	2.75	2.75	3.10	2.75	3.20
Blues, Bronze Chinese Milori Prussian Soluble ....lb.	.36½	.38	.36½	.38	.35½	.38
Bone, 4½ + 50% raw, Chicago ....ton	20.00	22.00	19.00	22.00	19.00	25.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ....lb.	.05½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp..ton	...	23.00	22.75	24.00	16.00	24.00
Domestic, bgs, Chicago..ton	22.75	26.00	16.00	21.00	...	...
Borax, tech, gran, 80 ton lots, sacks, delv ....ton *i*	...	40.00	36.00	40.00	36.00	36.00
bbls, delv ....ton *i*	...	50.00	46.00	50.00	46.00	46.00
c-l, sacks, delv ....ton *i*	...	44.00	40.00	44.00	40.00	40.00
c-l, bbls, delv ....ton *i*	...	54.00	50.00	54.00	50.00	50.00
Tech, powd, 80 ton lots, sacks ....ton *i*	...	45.00	41.00	45.00	41.00	41.00
bbls, delv ....ton *i*	...	56.00	51.00	56.00	51.00	51.00
c-l, sacks, delv ....ton *i*	...	49.00	45.00	49.00	45.00	45.00
c-l, bbls, delv ....ton *i*	...	59.00	55.00	59.00	55.00	55.00
Bordeaux Mixture, jobbers, East, c-l, tins, drs, cases lb.	.08	.16	.08	.16	...	.16
Jobbers, West, c-l ....lb.	.08	.10	.08	.10	...	.10
Dealers, East, c-l ....lb.	.08½	.16½	.08½	.16½	...	.16½
Dealers, West, c-l ....lb.	.09	.11	.09	.11	...	.11

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case.

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Bromine, cases .. ..lb.	.30	.43	.30	.43	.30	43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk ....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks .... lb.	...	.04	...	.04	.02¾	.04
Butyl, Acetate, norm drs, frt allowed ....lb.	.13	.13½	.13	.13½	.11	.14
tks, frt allowed ....lb.	.12	.13	.12	.13	.10	.13
Secondary tks, frt allowed lb.	..	.096	...	.096	.08	.096
drs, frt, allowed ......lb.	.106	.111	.106	.111	...	.111
Aldehyde, 50 gal drs wks lbs.	.19	.21	.19	.21	.19	.36
Secondary, drs ....lb.	.60	.75	.60	.75	.60	.75
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Lactate drs ....lb.	.22½	.23½	.22½	.23½	.22½	.29
Propionate, drs ....lb.	.18	.18½	.18	.18½	.17	.22
tks, delv ....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	..	.26	..	.26	.25	.26
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes...lb.	.75	.85	.75	.85	.65	.85
Cadmium Metal ....lb.	.65	.70	.55	.70	.55	.65
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	2.10	2.00	2.10	2.00	3.00
Arsenate, jobbers, East of Rocky Mts, drs ......lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06¼	.07½	.06¼	.07½	...	...
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	...	...
dealers, drs ....lb.	.06½	.06¾	.06¼	.06¾	...	...
Carbide, drs ....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs c-l wks ... .ton	...	19.50	...	19.50	...	19.50
Solid, 650 lb drs c-l f.o.b. wks .... ton	...	17.50	...	17.50	...	17.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.17	...	.17	...	.17
Gluconate, tech, 125 lb bbls ....lb.	...	.28	...	.28	.25	.28
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls ....lb.	.21	.22	.20	.22	.19	.20
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls....lb.	.18	.20	.17	.20	.17	.19
Camphor, slabs ....lb.	.49	.50	.49	.52	.51	.59
Powder ....lb.	.49	.50	.50	.52	.51	.59
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	.06½	.07
cartons, delv ....lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv ....lb.	...	.08¼	...	.08¼	...	08¼
Bisulfide, 500 lb drs....lb.	.05¼	.08	.05¼	.08	.05½	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv ....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom grd lb.	.11¼	.13	.09½	.15	.09¼	.13
80-100 mesh, c-l, bgs ....lb.	.11¾	.14	.10	.16	.10	.14
Castor Pomace, 5½ NH_3, cl, bgs, wks ....ton	...	17.00	17.00	18.50	...	...
Imported, ship, bgs ....ton	...	17.25	17.25	20.00	...	...
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.13	.18
Transparent, cs ....lb.	...	.20	...	.20	.16	.20
Cellulose, Acetate, 50 lb kgs ....lb.	.55	.60	.55	.60	.55	.90
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks ....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	.12	.18
Willow, powd, 100 lb bbl wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv ... .ton	22.40	23.00	22.40	30.00	...	...
Chestnut, clarified bbls wks lb.	...	.01⅞	...	.01⅞	.01⅝	.01⅞
25% tks wks ....lb	...	.01½	...	.01½	.01¼	.01½
Pwd, 60%, 100 lb bgs, wks ....lb	..	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	7.00	9.00
Powdered, bbls ....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks ...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks contract ....lb.	.07½	.08½	.07½	.08½	.07	.08½
cyls, c-l, contract .. lb. j	...	.05½	...	.05½	...	.05½
Liq tk wks contract..100 lb.	...	2.00	...	2.00	1.85	2.00
Multi c-l cyls wks cont..lb.	2.15	2.40	2.15	2.40	2.00	2.40
Chloroacetophenone, tins, wks ....lb.	...	2.00	...	2.00	...	...
Chlorobenzene, Mono, 100 lb drs, lc-l, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ....lb.	.30	.31	.30	.31	.30	.35
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	1.25
Chrome, Green, CP ......lb.	.17	.18½	.17	.30	.20	.30
Yellow ....lb.	.14	.16	.14	.16	.15	.16
Chromium, Acetate, 8% Chrome bbls ....lb.	.05	.05¾	.05	.05¾	.05	.05¾
20° soln, 400 lb bbls .. lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price.

Current

Coal Tar
Diphenylguanidine

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Coal tar, bbls ....bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls ......lb.	...	.60	...	.60	.60	.80
Carbonate tech, bbls ....lb.	1.35	1.40	1.35	1.40	1.34	1.40
Hydrate, bbls ....lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ...lb.	...	.30	...	.30	.30	.40
Resinate, fused, bbls ...lb.	...	.12½	...	.12½	...	.12½
Precipitated, bbls ....lb.	...	.32	...	.32	.32	.42
Cobalt Oxide, black, bgs ..lb.	1.25	1.35	1.25	1.35	1.25	1.35
Cochineal, gray or bk bgs lb.	.34	.39	.34	.39	.33	.42
Teneriffe silver, bgs ....lb.	.35	.40	.35	.40	.34	.43
Copper, metal, electrol 100 lb.	...	8.00	8.00	9.00	7.87½	9.00
Carbonate, 400 lb bbls ..lb.	...	.08¼	...	.08¼	...	.08¼
52-54% bbls ....lb.	.14½	.16¼	.14½	.16¼	.15½	.16
Chloride, 250 lb bbls ...lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs ....lb.	.37	.38	.37	.38	.37	.40
Oleate, precip, bbls .....lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls ..lb.	.15	.17	.15	.17	.12½	.17
black bbls, wks ....lb.	.14½	.15	.14	.16½	...	...
Resinate, precip, bbls ...lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls .. lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-l wks 100 lb.	...	3.85	...	3.85	3.75	3.85
Copperas, crys and sugar bulk c-l, wks, bgs ....ton	12.00	13.00	12.00	13.00	12.00	14.50
Corn Syrup, 42 deg, bbls ....100 lb.	...	3.63	3.49	3.63	3.04	3.59
43 deg, bbls ......100 lb.	...	3.68	3.54	3.68	3.09	3.64
Corn Sugar, tanners, bbls ....100 lbs.	...	3.56	3.46	3.66	...	...
Cotton, Soluble, wet, 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls .....lb.	...	.16¾	.16¼	.17¼	.17½	.19½
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ......gal.	.12	.13	.11½	.13	.10	.12½
Grade 2 ....gal.	.109	.12	.10½	.12	.10½	.12
Cresol, USP, drs ....lb.	.11	.11½	.11	.11½	.11	.11½
Crotonaldehyde, 98% 50 gal drs ....lb.	.32	.36	.32	.36	.26	.36
Cudbear, English ....lb.	.19	.25	.19	.25	.19	.25
Philippine, 100 lb bale ..lb.	.03¾	.04¾	.03½	.04¾	.03½	.04¾
Cyanamid, bags c-l frt allowed Ammonia unit	...	1.07½	...	1.07½	...	1.07½
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	4.05	3.95	4.15	3.50	4.20
British Gum, bgs ...100 lb.	4.30	4.50	4.20	4.50	3.75	4.60
White, 140 lb bgs ..100 lb.	4.00	4.10	3.90	4.10	3.47	4.20
Potato, Yellow, 220 lb bgs ....lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl ...lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ....lb.	...	.08	.08	.08¾	.06¾	.08¾
Diamylamine, drs, wks ....lb.	...	1.00	...	1.00	...	1.00
Diamylene, drs, wks ......lb.	.095	.102	.095	.102	.09	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.09	.77
tks, wks ....lb.	...	.075	...	.075	...	...
Diamylphthalate, drs wks gal.	.18	.19½	.18	.20½	...	.20½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls ....lb.	2.25	2.45	2.25	2.45	2.35	2.45
Dibutylphthalate, drs, wks lb.	.20	.21	.20	.23	.20½	.21
Dibutyltartrate, 50 gal drs lb.	.35	.40	.35	.40	.35	.40
Dichlorethylene, drs .....gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks ....lb.	.16	.17	.16	.17	.16	.21
tks, wks ....lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	.15	.23	...	.15
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.0278	.040
tks, wks ....lb.	...	.02½	...	.02½	...	.02½
Diethanolamine, tks ......lb.	...	.30	...	...	...	...
Diethylamine, 400 lb drs ..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs .....lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅛	.35	.31⅛	.35	.31⅛	.35
90% grade, drs ......lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs..lb.	.52	.55	.52	.55	.52	.55
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs ....lb.	.18½	.19	.18½	.27	.26	.27
Diethylsulfate, tech, 50 gal drs ....lb.	...	...	...	...	...	...
Diethyleneglycol, drs .....lb.	.15½	.17½	.15½	.17½	.14	.16
Mono ethyl ethers, drs..lb.	.15	.17	.15	.17	.15	.17
tks, wks ....lb.	...	.15	...	.15	...	...
Mono butyl ether, drs ..lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs wks ....lb.	.20	.24	.20	.27	.26	.27
Diglycol Oleate, bbls .....lb.	.16	.24	.16	.24	.16	.18
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	...	.95	...	.95	.95	1.20
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.29	.30
Dimethyl Ethyl Carbinol, drs ....lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs ...lb.	.20	.21½	.20½	.24½	.24	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls ....lb. k	.17	.19½	.17	.19½	.17	.19½
Dintrochlorobenzene, 400 lb bbls ....lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15½	.16½
Diphenyl ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.31	.32	.31	.34
Diphenylguanidine, 100 lb bbl ....lb.	.36	.37	.36	.37	.36	.37

k Higher price is for purified material.

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt . ton	36.00	40.00	36.00	40.00	35.00	40.00
Extract . . . lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb. cases . . . lb.	...	.63	.46	.63	.40	.54
Epsom Salt, tech, 300 lb bbls c-l NY . . . 100 lb.	1.80	2.00	1.80	2.25	2.20	2.25
USP, c-l, bbls . . . 100 lb.	...	2.00	2.00	2.25	2.25	2.25
Ether, USP anaesthesia 55 lb drs . . . lb.	.22	.23	.22	.23	.22	.24
(Conc) . . . lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed . . . lb.	...	.06	...	.06	...	...
Nitrous, conc, bottles . . . lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs . . . lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks . . . lb.	.07½	.08	.07½	.08	.07½	.08
drs . . . lb.	.08½	.09	.08½	.09	.08½	.09
Anhydrous, tks . . . lb.	...	.08½	...	.08½	.08½	.10
drs . . . lb.	.09½	.10	.09½	.10	.09½	.10¼
Acetoacetate, 50 gal drs lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drs . . . lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs . . . lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys . . . lb.	...	.30	...	.30	...	.30
Crotonate, drs . . . lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs . . . lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks . . . lb.	.25	.29	.25	.29	.25	.33
Methyl Ketone, 50 gal drs, frt allowed . . . lb.	.08½	.09	.08½	.09	.08½	.09
tks, frt allowed . . . lb.	...	.07½	...	.07½	...	...
Oxalate, drs, wks . . . lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks . . . lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb drs . . . lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont . . . lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drs . . lb.	.0545	.0994	.0545	.0994	.0545	.09
Glycol, 50 gal drs, wks lb.	.17	.21	.17	.28	.26	.28
tks, wks . . . lb.	...	.16	...	...	...	...
Mono Butyl Ether, drs, wks . . .	.20	.21	.20	.21	.20	.21
tks, wks . . . lb.	...	.19	...	.19	.19	.19
Mono Ethyl Ether, drs, wks . . .	.16	.17	.16	.17	.15	.17
tks, wks . . . lb	...	.15	...	.15	.15	.15
Mono Ethyl Ether Acetate, drs, wks . . .	.17½	.18½	.17½	.18½	.16½	.18½
tks, wks . . . lb.	...	.16½	...	.16½	.16½	.16½
Mono, Methyl Ether, drs wks . . . lb.	.19	.23	.19	.23	.21	.23
tks, wks . . . lb.	...	.18	...	...	...	...
Stearate . . .	.18	.18	.18	.18	.18	.18
Oxide, cyl . . . lb.	...	.75	...	.75	...	.75
Ethylidenaniline . . . lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery . . . ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks . . . ton	14.00	14.50	14.00	14.50	13.50	14.50
Ferric Chloride, tech, crys, 475 lb bbls . . . lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys . . . lb.	.06¼	.06½	.06¼	.06½	...	...
Fish Scrap, dried, unground, wks . . . unit *l*	...	2.25	2.25	2.90	2.25	2.60
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis . . . unit *m*	...	2.25	2.00	2.25	2.00	2.50
Fluorspar, 98%, bgs . . .	30.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb bbls, wks . . . lb.	.06	.07	.06	.07	.06	.07
Fossil Flour . . . lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines . . . ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs . . . ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs . . . lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips . . . lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes . . lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls . . lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes . . . lb.	.16	.18	.16	.18	.16	.18
Sticks . . . ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls . . lb.	.42	.43	.42	.43	.42	.43
Gall Extract . . . lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs . . lb.	...	.06	.05	.08	.04	.08
Singapore cubes, 150 lb bgs . . . 100 lb.	.08	.09	.07⅛	.09⅛	.05	.09⅛
Gelatin, tech, 100 lb cs . . . lb.	.50	.55	.50	.55	.45	.55
Glauber's Salt, tech, c-l wks . . . 100 lb.	1.10	1.30	1.10	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glucose (grape sugar) dry 70-80° bgs, c-l, NY . . 100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb. bgs . . . 100 lb.	...	2.33	...	2.33	...	2.33
Glue, bone, com grades, c-l bgs . . . lb.	...	.08	...	.08	.07	.12½
Better grades, c-l, bgs lb.	.09	.09½	.09	.09½	.09½	.16
Casein, kgs . . . lb.	.18	.22	.18	.22	.18	.22
Glycerin, CP, 550 lb drs . . lb.	.14	.14½	.14	.14½	.11	.14½
Dynamite, 100 lb drs . . . lb.	.13¾	.14¼	.13¾	.14¼	.10	.14¼
Saponification, drs . . . lb.	.10½	.11	.10	.11	.06¾	.10½
Soap Lye, drs . . . lb.	.09½	.10	.09	.10	.06¼	.09½

l + 10; *m* + 50.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Glyceryl Phthalate ....lb.	...	.28	...	.28	...	.28
Glyceryl Stearate, bbls....lb.	...	.18	...	.18	...	.18
Glycol Phthallate ....lb.	...	.29	.28	.29	...	.28
Glycol Stearate ....lb.	...	.23	.18	.23	.18	.20
Graphite,						
Crystalline, 500 lb bbls ......lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls .....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls ....lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes ....lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts ......lb.	.11½	.14	.09½	.14	.07¾	.10⅝
White sorts, No. 1, bgs ......lb.	.21	.22	.21	.22	...	...
No. 2, bgs ....lb.	.19	.20	.19	.21	...	...
Powd, bbls ....lb.	.15½	.16½	.13½	.16½	...	...
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY ....lb.	.02½	.10½	.02½	.10½	.02½	.10½
Egyptian, 200 lb cases, f.o.b. NY ....lb.	.12	.15	.12	.15	.12	.15
California, f.o.b. NY, drs ....ton	29.00	55.00	29.00	55.00	...	...
Benzoin Sumatra, USP, 120 lb cases ....lb.	.20	.21	.20	.28	.18½	.23
Copal Congo, 112 lb bgs, clean, opaque ....lb.	.21¾	.22¼	.21¾	.24⅝	.24⅛	.28
Dark, amber ....lb.	.07¼	.07¾	.07¼	.09¼	.08⅝	.10½
Light, amber ....lb.	.12½	.13	.12	.14⅞	.14⅜	.19
Copal, East India 180 lb bgs						
Macassar pale bold ....lb.	.10	.10½	.09½	.10¾	.09⅞	.10½
Chips ....lb.	.05½	.06	.05½	.06	...	...
Nubs ....lb.	.08½	.09	.08½	.09	...	...
Dust ....lb.	.04	.04½	.03¾	.04½	...	...
Singapore						
Bold ....lb.	.15⅝	.16⅛	.15⅝	.17	.16	.17
Chips ....lb.	.04⅝	.05⅛	.04⅝	.05⅛	...	...
Nubs ....lb.	.10	.10½	.10	.11	...	...
Dust ....lb.	.04	.04½	.03¾	.04½	...	...
Copal Manilla, 180-190 lb baskets, Loba A .....lb.	.11¾	.12¼	.11¾	.12¼	.11⅜	.14½
Loba B ....lb.	.10¾	.11¼	.10¼	.11¼	.10¼	.13½
Loba C ....lb.	.10⅛	.10⅝	.10⅛	.11⅜	.09¾	.12
MA sorts ....lb.	.06	.06½	.06	.07¼	.06½	.07½
DBB ....lb.	.08⅜	.08⅞	.08	.08⅞	.08	.09½
Dust ....lb.	.04⅞	.05⅜	.04⅞	.05⅜	...	...
Copal Pontianak, 224 lb cases, bold genuine ....lb.	.14⅜	.14⅞	.14⅜	.16⅝	.16⅛	.19
Mixed ....lb.	.12⅞	.13⅜	.12⅞	.14½	...	...
Chips ....lb.	.06⅞	.07¾	.06⅞	.07⅞	...	...
Nubs ....lb.	.09⅝	.10⅛	.09⅝	.10¾	..	...
Split ....lb.	.12⅜	.12⅞	.12⅜	.13⅜	...	...
Dammar Batavia, 136 lb cases						
A ....lb.	.20⅛	.20⅝	.19	.21¼	...	...
B ....lb.	.19⅛	.19⅝	.18	.20¼	...	...
C ....lb.	.17	.17⅛	.16	.18¼	...	...
D ....lb.	.12½	.13	.11¾	.13⅞	...	...
A/D ....lb.	.15	.15½	.14	.16	...	...
A/E ....lb.	.12½	.13½	.11¾	.13½	...	...
E ....lb.	.06¾	.07¼	.07	.07¼	.07	.09½
F ....lb.	.06⅜	.06⅞	.06⅛	.06⅞	.05½	.06⅝
Singapore						
No. 1 ....lb.	.16⅛	.16⅝	.15⅝	.17	.15½	.18
No. 2 ....lb.	.12⅛	.12⅝	.10⅝	.12⅝	.09⅜	.11
No. 3 ....lb.	.04⅞	.05⅜	.04⅝	.05⅞	.05⅛	.07
Chips ....lb.	.08⅞	.09⅜	.08⅞	.09¾	.09	.10¼
Dust ....lb.	.05	.05½	.04¾	.05¾	.05	.06
Seeds ....lb.	.06¼	.06¾	.04¾	.07¼	.06	.07¾
Ester ....lb.	.07⅝	.08⅜	.07¼	.08⅜	...	...
Elemi, cons ....lb.	.11¾	.12¼	...	...	...	...
Gamboge, pipe, cases .....lb.	.55	.56	.55	.65	.57	.65
Powdered, bbls ....lb.	.65	.70	.65	.75	.67	.75
Ghatti, sol. bgs ....lb.	.11	.15	.09	.15	.09	.09½
Karaya, pow bbls xxx ....lb.	.24	.25	.23	.25	.23	.25
xx ....lb.	.16	.17	.15	.17	.15	.16
No. 1 ....lb.	.08	.09	.08	.09	.08	.11
No. 2 ....lb.	.07	.08	.07	.08	.07	.09
Kauri, NY, San Francisco,						
Brown XXX, cases ....lb.	.60	.60½	.60	.60½	...	...
BX ....lb.	.33	.33½	.33	.33½	...	...
B1 ....lb.	.19	.19½	.19	.19½	...	...
B2 ....lb.	.14½	.15	.14½	.15	...	...
B3 ....lb.	.12	.12½	.12	.12½	...	...
Pale XXX ....lb.	.65	.65½	.65	.65½	...	...
No. 1 ....lb.	.40	.40½	.40	.40½	...	...
No. 2 ....lb.	.22	.22½	.22	.22½	...	...
No. 3 ....lb.	.15	.15½	.15	.15½	...	...
Kino, tins ....lb.	.70	.80	.70	.80	.75	.80
Mastic ....lb.	.55	.55½	.46	.55½	.35	.55½
Sandarac, prime quality, 200 lb bgs & 300 lb cks ...lb.	.32½	.33	.32½	.35½	.35	.50
Senegal, picked bgs ......lb.	.20	.21	.20	.21	17	.21
Sorts ....lb.	.11½	.12½	.09⅜	.12½	.08	.10
Thus, bbls ....280 lbs.	...	11.00	10.50	11.00	9.50	10.75
Strained ....280 lbs.	...	11.00	10.50	11.00	9.50	10.75
Tragacanth, No. 1, cases ....lb.	1.25	1.30	1.15	1.30	1.00	1.20
No. 2 ....lb.	1.15	1.20	1.05	1.20	...	...
No. 3 ....lb.	1.00	1.05	.95	1.05	...	...
No. 4 ....lb.	.90	.95	.85	.95	...	...
No. 5 ....lb.	.80	.85	.75	.85	...	...
No. 6, bgs ....lb.	.14	.15	.14	.15	...	...
Sorts, bgs ....lb.	.11	.12	.11	.12	...	...
Yacca, bgs................lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.04

	Current	Market	1935 Low	1935 High	1934 Low	1934 High
Helium, cyl. (200 cu. ft.) cyl.	...	25.00	...	25.00	25.00	25.00
Hematite crystals, 400 lb bbls ....lb.	.16	.18	.16	.18	.16	.18
Paste, 500 bbls ....lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb bbls wks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.04½
tks ....lb.	...	.02½	...	.02½	...	...
Hexalene, 50 gal drs wks..lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C. Group 3, tks ....gal.	...	.14	...	.14	...	.14
Hexamethylenetetramine, drs ....lb.	.37	.39	.37	.39	.37	.39
Hexyl Acetate, delv drs ...lb.	.12	.12½	.12	.12½	.12	.12½
tks ....lb.	...	.11½	...	.11½	...	...
Hoof Meal, f.o.b. Chicago unit	...	2.50	2.50	2.70	1.85	2.70
South Amer. to arrive unit	...	1.85	...	1.85	1.65	1.80
Hydrogen Peroxide, 100 vol, 140 lb cbys ....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo Madras, bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs ....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ....lb.	...	.12	...	.12	...	.12
Iodine, crude ....per kilo	...	15s 1d	...	15s 1d	...	15s 1d
Resublimed, kgs ....lb.	...	1.90	...	1.90	1.90	2.30
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.07	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.14	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English ....lb.	.07½	.08¾	.07½	.08¾	.07½	.09
Isobutyl Carbinol (128-132°C) drs, wks ....lb.	.33	.34	.33	.34	.34	.34
tks, wks ....lb.	...	.32	...	.32	.32	.326
Isopropyl Acetate, tks ....lb.	...	.07½	...	.07½	.07	.07½
drs, frt allowed ....lb.	.08½	.09	.08½	.09	...	...
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY, Brown ....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken, f.o.b. NY, bbls ....lb.	...	.09½	...	.09½	.09½	.09½
White, broken, bbls ....lb.	...	.11	...	.11	.11	.11
cryst bbls ....lb.	...	.10½	...	.10½	.10½	.10½
gran, bbls ....lb.	...	.11	...	.11	.11	.11
powd, bbls ....lb.	...	.11¼	...	.11¼	.11¼	.11¼
Arsenate, East, jobbers, drs ....lb.	.09	.09½	.09	.09½	...	...
Dealers, drs ....lb.	.09¼	.10½	.09¼	.10½	...	...
West, jobbers, drs ....lb.	...	.09	...	.09	...	...
dealers, drs ....lb.	...	.10	...	.10	...	...
Linoleate, solid bbls ....lb.	.26	.26½	.26	.26½	.26	.26½
Metal, c-l, NY ....100 lb	...	4.00	3.50	4.00	3.50	4.25
Red, dry, 95% Pb_2O_4, delv ....lb.	.06½	.07½	.06	.0775	.06	.07¾
97% Pb_2O_4, delv ....lb.	.06¾	.07¾	.06¼	.08	...	...
98% Pb_2O_4, delv ....lb.	.07	.08	.06½	.0825	...	...
Nitrate, 500 lb bbls, wks..lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls ....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	.14	.18½
Stearate, bbls ....lb.	.22	.23	.22	.23	.22	.23
White, 500 lb bbls, wks..lb.	.06½	.07	.06½	.07	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06	...	.06	...	.06
Lime, chemical quicklime, f.o.b., wks, bulk ....ton	7.00	7.25	7.00	7.25	...	...
Hydrated, f.o.b., wks ..ton	8.50	12.00	8.50	12.00	...	...
Lime Salts, see Calcium Salts.						
Lime sulfur, sol, jobbers, tks ....gal.	...	.10	...	.10	...	...
drs ....gal.	.13½	.15½	.13½	.15½	...	...
Dealers, tks ....gal.	...	.10½	...	.10½	...	...
drs ....gal.	.14	.16½	.14	.16½	...	...
Linseed Meal, bgs ....ton	...	29.00	28.00	40.00	30.50	41.00
Litharge, coml, delv, bbls..lb.	.05½	.06½	.05	.06¾	.051	.06¾
Lithopone, dom, ordinary, delv, bgs ....lb.	.04½	.04¾	.04½	.04¾	.04½	.04¾
bbls ....lb.	.04¾	.05	.04¾	.05	.04¾	.05
High strength, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Titanated, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.08½	.10½	.08½	.10½	.08½	.12½
Solid, 50 lb boxes ....lb.	.13½	.17½	.13½	.17½	.13½	.17½
Sticks ....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	55.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs, c-l, wks ....ton	36.00	39.00	36.00	39.00	34.00	39.00
Magnesium fluosilicate, crys, 400 lb bbls, wks ....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb. bbls ....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls ...lb.	...	.50	...	.50	...	.50
Palmitate, bbls ....lb.	.23	.24	.22	.24	.21	.23
Stearate, bbls ....lb.	.20	.22	.19	.22	...	...
Linoleate, lig drs ....lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls ....lb.	...	.12	...	.12	.11½	.12½
Manganese Borate, 30%, 200 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.07	.12
Dioxide, tech (peroxide), drs ....lb.	.03¾	.06	.03¾	.06	.03¾	.06
Mangrove 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African ....ton	28.00	29.00	28.00	30.00	26.00	32.00
Marble Flour, blk ....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride ....lb.	.71	.76	.71	.93	.73	.93

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Mercury metal . . . 76 lb. flasks	71.50	73.50	71.50	76.50	66.50	79.00
Meta-nitro-aniline . . . . lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200						
lb bbls . . . . lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300						
lb bbls . . . . lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs . . . . lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls . . . . . lb.	.09	.10	.09	.10	.09	.11
Stearate, bbls . . . . lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb						
bbls . . . . lb.	.67	.69	.67	.69	.67	.69
Methanol, 95%, frt allowed,						
drs . . . . gal. *o*	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed . . . . gal. *o*	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal. *o*	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed . . . . gal. *o*	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed . . . . gal. *o*	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed,						
drs . . . . gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed . . . . gal. *o*	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-						
100%, drs . . . . lb.	.18	.18½	.18	.18½	.18	.18½
Synthetic, 410 lb drs . . . lb.	.16	.17	.16	.17	.16	.17
tks . . . . lb.	. . .	.15	. . .	.15	.15	.15
Acetone, frt allowed,						
drs . . . . gal. *p*	.49½	.68½	.49½	.73½	. . .	. . .
tks, frt allowed, drs gal. *p*	.44	. . .	.44	.52½	. . .	. . .
Synthetic, frt allowed, east						
of Rocky M., drs gal. *p*	.57½	.60	.57½	.60	.57½	.60
tks, frt allowed	. . .	.53	. . .	.53	. . .	. . .
West of Rocky M., frt						
allowed, drs . . . . gal. *p*	.60	.63	.60	.63	. . .	. . .
tks, frt allowed . . gal. *p*	. . .	.56	. . .	.56	. . .	. . .
Hexyl Ketone, pure, drs lb.	. . .	.60	. . .	.60	.60	1.20
Anthraquinone . . . . lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks . . . . . . lb.	. . .	.10½	. . .	.10½	.10½	.10½
Chloride, 90 lb cyl . . . . . lb.	. . .	.45	. . .	.45	.45	.45
Ethyl Ketone, tks . . . . . . lb.	. . .	.07½	. . .	.07½	.07½	.07½
Propyl carbinol, drs . . . lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks . . lb.	35.00	. . .	35.00	. . .	. . .	. . .
Michler's Ketone, kgs . . . . lb.	. . .	2.50	. . .	2.50	. . .	2.50
Molasses, blackstrap, tks,						
f.o.b. NY . . . . gal.	.08	.08¼	.07¾	.08¼	.06	.09
Monoamylamine, drs, wks lb.	. . .	1.00	. . .	1.00	. . .	1.00
Monochlorobenzene, see						
Chlorobenzene, mono.						
Monoethanolamine, tks, wks lb.	. . .	.30	. . .	. . .	. . .	. . .
Monomethylparaminosulfate,						
100 lb drs . . . . lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls . . lb.	. . .	.04¼	. . .	.04¼	.03¾	.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs . . . . ton	23.50	24.50	23.50	27.00	24.50	32.00
J2 bgs . . . . ton	. . .	14.75	15.00	15.75	15.75	18.00
R2 bgs . . . . ton	. . .	14.50	16.00	16.50	16.25	18.00
Naphtha. v.m. & p. (deodorized)						
see petroleum solvents.						
Naphtha, Solvent, water-white,						
tks . . . . gal.	. . .	.30	.26	.30	.26	.30
drs, c-l . . . . gal.	. . .	.35	.31	.35	.31	.35
Naphthalene, dom, crude, bgs,						
wks . . . . lb.	1.65	2.40	1.65	2.40	. . .	. . .
Imported, cif, bgs . . . . lb.	. . .	1.90	. . .	1.90	1.75	1.90
Dyestuffs, bgs, bbls, Eastern						
wks . . . . lb.	.04¼	.04¾	.04¼	.04¾	. . .	. . .
Balls, ref'd, bbls, Eastern						
wks . . . . lb.	.04½	.05¼	.04½	.05¼	. . .	. . .
Flakes, ref'd, bbls, Eastern						
wks . . . . lb.	.04½	.05¼	.04½	.05¼	. . .	. . .
Dyestuffs, bgs, bbls, Mid-						
West wks . . . . lb. *q*	.04¾	.05¼	.04¾	.05¼	. . .	. . .
Balls, ref'd, bbls, Mid-West						
wks . . . . lb. *q*	.05	.05¾	.05	.05¾	. . .	. . .
Flakes, ref'd, bbls, Mid-						
West wks . . . . lb. *q*	.05	.05¾	.05	.05¾	. . .	. . .
Nickel Chloride, bbls . . . . . lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY . . lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY . . . lb.	.12½	.13	.12½	.13	.11½	.13
Single, 400 lb bbls, NY lb.	.11½	.12	.11½	.12	.11½	.12
Metal ingot . . . . lb.	. . .	.35	. . .	.35	.35	.35
Nicotine, free 50%, 8 lb tins,						
cases	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs . . . . . . lb.	.77	.80	.67	.80	.67	.75
Nitre Cake, blk . . . . ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000						
lb drs, wks . . . . lb.	.09	.11	.09	.11	.09	.11
tks . . . . lb.	. . .	.08½	. . .	.08½	. . .	.08½
Nitrocellulose, c-l-l cl, wks lb.	.27	.34	.27	.34	.27	.34
Nitrogenous Mat'l, bgs, imp unit	. . .	2.25	2.25	2.75	. . .	. . .
dom, Eastern wks . . . . unit	. . .	2.25	2.25	2.40	2.35	3.25
dom, Western wks . . . . unit	. . .	2.00	1.90	2.30	. . .	. . .
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs . . . . . lb.	.19	.20	.19	.20	.18	.20
Chinese, bgs . . . . lb.	.19	.20	.19	.20	.17	.20
Oak Bark Extract, 25%, bbls lb.	. . .	.03½	. . .	.03½	.03⅜	.03½
tks . . . . lb.	. . .	.02¾	. . .	.02¾	. . .	. . .
Octyl Acetate, tks, wks . . . lb.	. . .	.15	. . .	. . .	. . .	. . .
Orange-Mineral, 1100 lb cks						
NY . . . . lb.	.09½	.10	.09¼	.10¼	.09¼	.10½
Orthoaminophenol, 50 lb kgs . lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.82	.84	.82	.84	.82	1.15
Orthochlorophenol, drs . . . . lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs . . . . lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000						
lb drs . . . . lb.	.05½	.06	.05½	.06	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Orthonitrochlorobenzene, 1200 lb drs, wks ....lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks ....lb.	.07	.10	.05½	.10	.05½	.06
Orthonitrophenol, 350 lb drs ....lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l ....lb.	.14½	.15	.14½	.15	.14	.15
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst ....lb.	.17	.25	.17	.25	.16	.25
51 deg liquid ....lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs ....lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs						
122-127 deg M P ....lb.	.04	.04¾	.04	.04¾	.04½	.04¾
128-132 deg M P ....lb.	.05	.0515	.05	.0515	.04¾	.0515
133-137 deg M P ....lb.	.0575	.06	.0575	.06	.05	.06
Para aldehyde, 110-55 gal drs ....lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	.52	.85
Aminohydrochloride, 100 lb kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	.78	1.05
Chlorophenol, drs ....lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs ..lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr ....gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene 150 lb bbls wks ....lb.	.16	.20	.16	.20	.16	.20
Formaldehyde, bbls, wks lb.	.38	.39	.38	.39	...	...
Nitroacetanilid, 300 lb bbls ....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.35	.37	.35	.37	.35	.37
Phenylenedamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs ....lb.	.32	.50	.32	.50	.32	.50
Toluenesulfonamide, 175 lb bbls ....lb.	.70	.75	.70	.75	.70	.75
tks, wks ....lbs.	...	.31	...	.31	...	...
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kgs ....lb.	...	.24	...	.24	.23	.24
250 lb kgs ....lb.	...	.22	...	.22	...	.22
Perchlorethylene, 50 gal drs ....lb.	...	.15	...	.15	...	.15
Persian Berry Ext, bbls ..lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C, group 3 tks ....gal.	...	.09	...	.09	.09	.09
drs, group 3 ....gal.	.10	.15	.10	.15	...	...
Petrolatum, dark amber, bbls ....lb.	.02⅜	.02⅞	.02	.02⅞	...	...
Light, bbls ....lb.	.02⅞	.03⅜	.02½	.03⅜	...	...
Medium, bbls ....lb.	.02⅝	.03⅛	.02¼	.03⅛	...	...
Dark green, bbls ....lb.	.02½	.02¾	.02½	.02¾	...	...
White, lily, bbls ....lb.	.05½	.06¼	.05¼	.06½	...	...
White, snow, bbls ....lb.	.06½	.07¼	.06¼	.07½	...	...
Red, bbls ....lb.	.02⅜	.02⅛	.02¼	.02⅞	...	...
Petroleum Ether, 30-60°, group 3, tks ....gal.	...	.13	...	.13	.11	.13
drs, group 3 ....gal.	.15	.16	.15	.16	.15	.17

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Cleaners naphthas, group 3, tks, wks ....gal.	.06⅞	.07¼	.06⅞	.07¼	...	...
Bayonne, tks, wks ..gal.	...	.09	...	.09	...	...
West Coast, tks ....gal.	...	.15	...	.15	...	...
Hydrogenated naphthas, frt allowed East, tks ...gal.	...	.17½	...	.17½	...	...
No. 2, tks ....gal.	...	.22½	...	.22½	...	...
No. 3, tks ....gal.	...	.17½	...	.17½	...	...
No. 4, tks ....gal.	...	.22½	...	.22½	...	...
Lacquer diluents, tks, Bayonne ....gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks ....gal.	.07⅞	.08	.07⅞	.08	.06⅞	.08⅜
Naphtha, V.M.P., East, tks, wks ....gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ...gal.	.06⅞	.07¼	.06⅞	.07¼	.06¼	.07¼
Petroleum thinner, East, tks, wks ....gal.	...	.09	...	.09	.09	.09
Group 3, tks, wks ...gal.	.05⅞	.06⅛	.05⅞	.06¼	.05⅞	.06⅜
Rubber Solvents, stand grd, East, tks, wks ....gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ..gal.	.06⅞	.07¼	.06⅞	.07¼	.06⅜	.06⅞
Stoddard Solvent, East, tks, wks ....gal.	...	.09	...	.09	.09	.09½
Group 3, tks, wks ...gal.	.06⅜	.07	.06⅜	.07	.05¾	.07⅛
Phenol, 250-100 lb drs ....lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs ....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs ....lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins ....lb.	20.00	22.00	20.00	22.00	20.00	22.00

Current

Phosphate Rock
Rosin Oil

	Current Market		1935		1934	
			Low	High	Low	High
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ....ton	...	3.40	3.25	3.40	2.85	3.25
70% basis ....ton	...	3.90	...	3.90	3.35	3.90
72% basis ....ton	...	4.40	...	4.40	3.85	4.40
75-74% basis ....ton	...	5.40	...	5.40	4.90	5.40
75% basis ....ton	...	5.50	...	5.50	5.05	5.50
77-80% basis ....ton	...	6.50	...	6.50	5.90	6.50
Tennessee, 72% basis ..ton	...	4.75	...	4.75	4.75	5.00
Phosphorous Oxychloride 175 lb cyl ....lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ......lb.	.44	.45	.44	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.44	.46	.44	.50	.48	.62
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks ....gal.	...	.59	...	.59	...	...
Straw color, bbls ......gal.	...	.59	...	.59	...	...
tks ....gal.	...	.54	...	.54	...	...
Pitch Hardwood, wks ....ton	...	15.00	15.00	20.00	...	20.00
Burgundy, dom, bbls, wks ....lb.	...	.03½	...	.03½	...	...
Imported ....lb.	.11	.13	.11	.13	...	...
Coaltar, bbls, wks .....ton	...	19.00	...	19.00	...	...
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	3.75	4.25	3.75	4.25	...	...
Stearin, drs ....lb.	.03	.04½	.03	.04½	...	...
Platinum, refd ....oz.	35.00	36.00	35.00	36.00	35.00	38.00
POTASH						
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.07⅜
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.08¼
Liquid tks ....lb.	...	.02⅞	...	.02⅞	.02⅞	.03⅝
Potash Salts, Rough Kainit 14% basis ....ton	...	8.50	...	8.50	8.50	9.70
Manure Salts, imported						
20% basis, blk ....ton	...	10.00	8.60	10.00	8.60	12.00
30% basis, blk ....ton	...	12.90	...	12.90	12.90	19.15
Domestic, cif ports, blk unit	...	.43	...	.43	...	...
Potassium Acetate ....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis bgs ....ton	...	22.00	...	22.00	22.00	37.15
Dom, blk ....unit	...	.40	...	.40	...	...
Pot & Mag Sulfate, 48% basis bgs ....ton	20.00	22.50	19.50	22.50	22.50	25.00
Potassium Sulfate, 90% basis bgs ....ton	...	29.85	29.85	35.00	35.00	42.15
Potassium Bicarbonate, USP 320 lb bbls ....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb cks ....lb.	.08⅛	.08⅝	.08⅛	.08⅝	.08⅛	.08⅝
Binoxalate, 300 lb bbls..lb.	.22	.23	.22	.23	.14	.23
Bisulfate, 100 lb kgs ..lb.	.35	.36	.35	.36	.33	.36
Carbonate, 80-85% calc 800 lb cks ....lb.	.07¼	.07½	.07½	.07⅞	.07	.07⅞
liquid, tks ....lb.	...	..	...	...	...	...
drs, wks ....lb.	.03½	.03¾	...	...	...	...
Chlorate crys, powd, 112 lb kgs, wks ....lb.	...	.09¾	...	.09¾	.08½	.09¾
gran, kgs ....lb.	.12	.13	.12	.13	...	...
powd, kgs ....lb.	.08¾	.09¾	.08¾	.09¾	...	...
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.60
Iodide, 75 lb bbls ......lb.	...	1.40	...	1.40	1.40	2.70
Metabisulfite, 300 lb bbls lb.	...	.15	...	.15	.10½	.15
Oxalate, bbls ....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, cks, wks ...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, 112 lb kgs lb.	.35	.38½	.35	.38½	.35	.39
Yellow, 500 lb casks ..lb.	.18	.19	.18	.19	.18	.19
Tartrate Neut, 100 lb kgs lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls ....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks	...	.07	...	.07	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls ....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs ......lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs .....100 lb.	...	2.75	...	2.75	2.25	2.75
Linseed Oil, kgs ...100 lb.	...	4.50	...	4.50	4.00	4.50
Pyridine, 50 gal drs .....gal.	...	1.25	...	1.25	...	1.25
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins ....lb.	2.75	3.00	2.75	3.00	2.75	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅝	...	.02⅝	.02¼	.02⅝
450 lb bbls, c-l ......lb.	...	.03⅛	...	.03⅛	.02¾	.03⅛
Solid, 63%, 100 lb bales cif ....lb.	...	.03⅝	...	.03⅝	.02⅞	.03⅝
Clarified, 64%, bales..lb.	...	.03⅞	...	.03⅞	.03	.03⅞
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.06	.06½	.06	.06½	.05½	.06½
Solid, 100 lb boxes .....lb.	.10	.12	.10	.12	.09½	.13
R Salt, 250 lb bbls, wks ..lb.	.44	.45	.44	.45	.40	.45
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.65	.80
Rochelle Salt, cryst ......lb.	.14	.14½	.14	.15	.12½	.16
Powd, bbls ....lb.	.13	.13½	.13	.13½	...	...
Rosin Oil, bbls, first run gal.	...	.38	.36	.45	.45	.48
Second run ....gal.	...	.45	.43	.48	.48	.53
Third run, drs ....gal.	...	.53	.50	.60	...	...

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	4.75	4.65	5.25	4.50	5.75
D	...	5.15	5.02½	5.25	4.60	5.85
E	...	5.25	5.22½	5.45	4.80	6.50
F	...	5.40	5.35	5.90	5.00	6.75
G	...	5.55	5.45	5.95	5.05	6.75
H	...	5.55	5.50	5.97½	5.10	6.75
I	...	5.55	5.55	6.00	6.75	4.05
K	...	5.60	5.60	6.00	5.30	6.75
M	...	5.65	5.65	6.02½	5.45	6.80
N	...	6.00	5.75	6.40	5.50	6.80
WG	...	6.05	6.05	6.87½	5.70	6.80
WW	...	6.75	6.40	7.55	5.90	6.85
Rosins, Gum, Savannah (280 lb unit):						
B	...	3.50	3.40	4.00	...	...
D	...	3.90	3.75	4.20	...	...
E	...	4.00	3.90	4 20	...	...
F	...	4.15	4.15	4.65	...	...
G	...	4.30	4.25	4.70	...	...
H	...	4.30	4.30	4.75	...	...
I	...	4.30	4.30	4.75	...	...
K	...	4.35	4.35	4.75	...	...
M	...	4.40	4.35	4.75	...	...
N	...	4.75	4.50	5.15	...	...
WG	...	4.80	4.80	5.60	...	...
WW	...	5.50	5.25	6.25	...	...
X	...	5.50	5.25	6.25	...	...
Rosins, Wood, wks (280 lb unit), wks, FF	...	4.20	4.20	6.35	...	...
I	...	4.60	4.60	7.00	...	...
M	...	5.05	5.00	7.25	...	...
N	...	5.75	5.40	7.75	...	...
Rosin, Wood. c-l, FF grade, NY	..	5.22	5.10	5.30	5.10	6.13
Rotten Stone, bgs mines ..ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls ..lb.	.05	.07	.05	.07	.05	.07
Selected, bbls ....lb.	.08	.10	.08	.10	.08	.12
Powdered, bbls ....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02½	.03¾
Sal Soda, bbls, wks ..100 lb.	...	1.30	...	1.30	1.10	1.30
Salt Cake, 94-96%, c-l, wks ....ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome, c-l, wks ......ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls ......lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls ....lb.	.069	.07⅞	.069	.07⅞	...	...
Cryst, bbls ....lb.	.069	.08	.069	.08	...	...
Satin, White, 550 lb bbls ..lb.	...	.01½	..	.01½	...	.01½
Shellac, Bone dry, bbls ..lb. r	.21	.23	.19	.32	.26	.37
Garnet, bgs ....lb.	.17	.19	.17	.27	.26	.32
Superfine, bgs ....lb. s	.16	.17	.16	.28	.23	.31
T. N., bgs ....lb. s	.14	.15	.13	.25	...	...
Schaeffer's Salt, kgs ......lb.	.48	.50	.48	.50	.48	.50
Silver Nitrate, vials ......oz.	...	.47	.38	.53¾	.31⅞	.40½
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.25
blk ....100 lb.	...	1.05	...	1.05	...	1.05
paper bgs ....100 lb.	...	1.20	...	1.20	...	1.20
bbls ....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs ....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	.03	.08
Acetate, tech, 450 lb bbls, wks ....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs ....lb.	...	.64	...	.64	.50	.64
Arsenate, drs ....lb.	...	.10½	...	.10½	.07¾	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs .. lb.	.46	.48	.46	.48	.45	.48
Bicarb, 400 lb bbl, wks . 100 lb.	...	1.85	...	1.85	1.85	1.85
Bichromate, 500 lb cks, wks ....lb.	.06⅛	.06⅝	.06⅛	.06⅝	.06⅛	.06⅝
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	...	...
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech ....ton	13.60	16.50	13.60	16.50	11.40	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks ....lb.	.07¼	.08¼	.07¼	.08¼	.07¼	.09½
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.18	.19	.18	.21	.19½	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.40	3.00
Tech, reg cryst, 375 lb bbls, wks ......100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide ....lb.	...	2.40	...	2.40	2.40	3.50
Metanilate, 150 lb bbls ..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ....100 lb.	2.65	3.05	2.65	3.05	2.65	3.05
cryst, bbls, wks ..100 lb.	...	3.25	...	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.02½	...	.02½	...	.02½
Napthenate, drs .... lb.	...	.09	...	.09	.09	.13
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ....ton	...	24.80	...	24.80	24.80	26.30
100 lb bgs ....ton	...	25.50	...	25.50	25.50	27.00
Bulk ....ton	...	23.50	...	23.50	23.50	24.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

Current

Sodium Nitrite
Thiocarbanilid

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Sodium (continued)						
Nitrite, 500 lb bbls ....lb.	.07¼	.08	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls ..lb.	.17	.18	.17	.19	.18	.19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.30	2.20	2.30	2.10	2.40
bgs, wks ......100 lb.	...	2.10	2.00	2.10	...	...
tri-sodium, tech, 325 lb bbls, wks ......100 lb.	...	2.70	2.60	2.70	2.60	2.70
bgs, wks ......100 lb.	...	2.50	2.50	2.60	...	...
Picramate, 160 lb kgs ..lb.	.67	.69	.67	.69	.69	.72
Prussiate, Yellow, 350 lb bbl, wks ....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, anhyd, 100 lb bbls ....lb.	.102	.132	.102	.15	...	.15
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.04½	.04¾	.04¼	.04¾	.04¾	.06
Stannate, 100 lb drs ....lb.	.34	.37	.31	.37	.33½	.37½
Stearate, bbls ....lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l, wks ....100 lb. ‡	1.30	1.55	1.25	2.35	2.20	2.85
Sulfide, 80% cryst, 440 lb bbls, wks ....lb.	...	.02¼	...	.02¼	.02¼	.02½
62% solid, 650 lb drs, c-l, wks ....lb.	...	.03	...	.03	...	.03
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.02½	.023	.02½	.02¼	.02½
Sulfocyanide, bbls .....lb.	.32	.42½	.32	.42½	.28	.42½
Tungstate, tech, crys, kgs ....lb.	...	.90	...	.90	.70	.90
Spruce Extract, ord, tks ..lb.	...	.01	...	.01	...	.01
Ordinary, bbls ....lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks ...lb.	...	.01⅝	...	.01⅝	...	.01⅜
Super spruce ext, bbls ..lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs ....100 lb.	3.58	3.78	3.36	3.78	2.81	3.76
Powd, 140 lb bgs ...100 lb.	3.68	3.88	3.46	3.66	2.71	3.66
Potato, 200 lb bgs ......lb.	.04½	.05½	.04½	.06	.05¼	.06
Imp, bgs ....lb.	.05¾	.06	.05¾	.06½	.06	.06½
Rice, 200 lb bbls ....lb.	...	.07¼	.07¼	.08½	.07½	.08½
Wheat, thick bgs ....lb.	...	.08¼	...	.08¼	.06¼	.08¼
Strontium carbonate, 600 lb. bbls, wks ....lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY ....lb.	.08¾	.09½	.08¾	.09½	.08¾	.11
Sulfur	...	...	...	...	...	...
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Superfine, bgs .....100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, red, 700 lb drs, wks ....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl lb.	.08½	.10	.08½	.10	.07	.10
Multiple units, wks ....lb.	...	.06½	...	.06½	...	...
tks, wks ....lb.	...	.04¾	...	.04¾	...	...
Refrigeration, cyl, wks ...lb.	...	.13	...	.13	...	...
Multiple units, wks ....lb.	...	.09¼	...	.09¼	...	...
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ......ton	53.00	56.00	53.00	62.00	58.00	75.00
dom, bgs, wks ....ton	...	35.00	...	35.00	...	...
Superphosphate, 16% bulk, wks ....ton	...	8.25	8.25	8.50	8.00	8.50
Run of pile ....ton	...	7.75	7.75	8.00	7.50	8.00
Talc, Crude, 100 lb bgs, NY ....ton	14.00	15.00	14.00	15.00	12.00	15.00
Refd, 100 lb bgs, NY ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bgs, NY ton	22.00	30.00	22.00	30.00	27.50	30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	70.00	75.00	70.00	75.00	70.00	75.00
Refd, white, bgs, NY ton	75.00	80.00	75.00	80.00	75.00	80.00
Tankage Grd, NY ....unit *	...	2.50	2.60	2.75	2.50	3.25
Ungrd ....unit *	...	2.35	2.35	2.50	2.00	2.75
Fert grade, f.o.b. Chicago ....unit *	...	2.35	2.30	2.60	1.80	2.40
South American cif..unit *	...	2.75	2.75	3.15	2.75	3.10
Tapioca Flour, high grade, bgs ....lb.	.0215	.05	.0215	.05	.0215	.05
Tar Acid Oil, 15%, drs gal.	.22	.23	.21	.23	.21	.22
25%, drs ....gal.	.24	.25	.23	.25	.23	.24
Tar, pine, delv, drs .....gal.	.25	.26	.25	.26	...	...
tks, delv ....gal.	...	.20	...	.20	...	...
Tartar Emetic, tech ......lb.	.22¾	.23	.22¾	.23	.23	.23
USP, bbls ....lb.	.28	.28½	.28	.28½	.27	.28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	...	...
tks ....lb.	.13	.14	.13	.14	...	...
Tetrachlorethane, 50 gal drs lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl lb.	.20	.25	.20	.25	.20	.25

‡ Bags 15c lower; * + 10.

Prices

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Tin, crystals, 500 lb bbls, wks ...lb.	.38½	.39	.36	.39½	.30	.40½
Metal, NY ...lb.	...	.51¾	.456	.52	.50⅞	.55⅜
Oxide, 300 lb bbls, wks lb.	.54	.56	.51	.58	.55	.60
Tetrachloride, 100 lb drs, wks ...lb.	...	.26¼	.24¾	.26½	.25½	.28½
Titanium Dioxide, 300 lb bbls ...lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ...lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Calcium Pigment, bbls ...lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks ...lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ...lb.	.75	.80	.75	.80	.75	.85
Para, red, bbls ...lb.	...	.75	...	.75	.75	.80
Toluidine, bgs ...lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks lb.	...	.40	...	.40	...	.40
Triamylamine, drs, wks ...lb.	...	1.25	...	1.25	1.00	1.25
Trichlorethylene, 50 gal drs lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs wks ...lb.	.26	.30	.26	.38	.35	.38
tks, wks ...lb.	...	.25	...	...	...	...
Tricresyl Phosphate, drs ...lb.	.21	.23	.21	.23	.19	.26
Triphenyl Guanidine ...lb.	.58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ...ton	27.50	30.00	27.50	30.00	...	...
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	12.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls ...gal.	...	.48½	.48½	.55½	.46¼	.63½
Savannah, bbls ...gal.	...	.43½	.43½	.50¼	.41¼	.58½
Jacksonville, bbls ...gal.	...	.43¼	.43¼	.50¼	.41¼	.58½
Wood Steam dist, bbls, c-l, NY ...gal.	...	.47	.45	.49	.41	.61
Urea, pure, 112 lb cases ...lb.	.15½	.17	.15½	.17	.15	.17
Fert grade, bgs c.i.f. ...ton	100.00	120.00	100.00	120.00	90.00	120.00
c.i.f. S.A. points ...ton	100.00	120.00	100.00	120.00	90.00	120.00
Urea Ammonia liq 55% NH_3, tks ...unit	...	.96	...	.96	...	.96
Valonia beard, 42%, tannin bgs ...ton	40.00	41.00	40.00	43.50	39.00	48.00
Cups, 32% tannin, bgs ...ton	26.00	26.50	26.00	28.50	23.00	32.50
Mixture, bark, bgs ...ton	...	32.00	...	32.00	..	32.00
Vermillion, English, kgs ...lb.	1.50	1.62	1.50	1.70	1.41	1.73
Vinyl Chloride, 16 lb cyl ...lb.	..	1.00	...	1.00	...	1.00
Wattle Bark, bgs ...ton	29.00	30.00	29.00	32.00	29.50	34.00
Extract, 60°, tks, bbls ...lb.	...	.03¾	...	.03¾	.03⅝	.03⅞

WAXES

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Wax, Bayberry, bgs ...lb.	.22	.23	.22	.23	.25	.30
Bees, bleached, white 500 lb slabs, cases ...lb.	.33½	.34	.33½	.34	.32	.37
Yellow, African, bgs ...lb.	.22	.23	.21	.23	.16	.22
Brazilian, bgs ...lb.	.21½	.23½	.21½	.25	...	...
Chilean, bgs ...lb.	.21½	.23½	.21½	.24½	...	...
Refined, 500 lb slabs, cases ...lb.	.27½	.28	.27½	.28	.21	.29
Candelilla, bgs ...lb.	.11	.12¼	.10	.12½	.10¼	.14½
Carnauba, No. 1, yellow, bgs ...lb.	.41	.43	.35	.43	.30	.40
No. 2, yellow, bgs ...lb.	.39½	.41	.34	.41	.34	.41
No. 2, N. C., bgs ...lb.	.35	.35½	.26½	.35½	.20	.29
No. 3, Chalky, bgs ...lb.	.32	.34	.21	.34	...	...
No. 3, N. C., bgs ...lb.	.32	.35½	.22½	.35½	.16¼	.25
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	...	...
Yellow, bgs ...lb.	.36	.38	.36	.38	...	...
Domestic, bgs ...lb.	.08	.11	.08	.11	...	...
Japan, 224 lb cases ...lb.	.07	.07¼	.06	.07¾	.06	.07½
Montan, crude, bgs ...lb.	.10½	.11½	.10½	.11½	.10	.11
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.22	.24	.19	.24	.18	.20
Cakes, cases ...lb.	.23	.25	.20	.25	.19	.21
Whiting, prec 200 lb bgs, c-l, wks ...ton	...	15.00	12.00	15.00	...	...
Alba, bgs, c-l, NY ...ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, NY ...ton	...	15.00	...	15.00	...	...
Wood Flour, c-l, bgs ...ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks ...gal.	.31	.33	.27	.33	.27	.29
Coml, tks, wks, frt allowed ...gal.	...	.30	.26	.30	...	.26
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY ...lb.	.09½	.11	.09½	.11	.09½	.11
Chloride fused, 600 lb drs, wks ...lb.	.04½	.05¾	.04½	.05¾	.04¼	.05¼
Gran, 500 lb bbls, wks ...lb.	.05	.05¾	.05	.05¾	.05⅛	.06
Soln 50%, tks, wks ...100 lb.	...	2.00	...	2.00	...	2.00
Cyanide, 100 lb drs ...lb.	.36	.41	.36	.41	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv ...lb.	...	.063	.057	.063	.0567½	.071
Metal, high grade slabs, c-l, NY ...100 lb.	...	4.60	4.05	4.60	4.05	4.75
E. St. Louis ...100 lb.	...	4.30	3.70	4.30	3.70	4.46
Oxide, Amer, bgs, wks ...lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
French, 300 lb bbls, wks ...lb.	.06½	.10⅞	.06½	.10⅞	.05¾	.11⅛
Palmitate, bbls ...lb.	.22	.23	.21	.23	.20	.22
Perborate, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls ...lb.	.19	.22	.18	.22	.18	.21

Current

Zinc Sulfate
Oil, Whale

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Zinc Sulfate, crys, 400 lb bbl, wks ......lb.	.028	.033	.028	.033	.02¾	.033
Flake, bbls ......lb.	.035	.032	.035	.032	...	...
Sulfide, 500 lb bbls, delv lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.13½
bgs, delv ......lb.	.10½	.11½	.10½	.11½	...	...
Sulfocarbolate, 100 lb kgs ......lb.	.24	.25	.24	.25	.21	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs ......lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs ......lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

	Current Market		1935 Low	1935 High	1934 Low	1934 High
Castor, No. 3, 400 lb bbls..lb.	.09¾	.10½	.09¾	.10½	.09¾	.10½
Blown, 400 lb bbls ......lb.	.11½	.12¼	.11½	.16	.11½	12¾
China Wood, bbls spot NY lb.	.16	Nom.	.094	.18	.07½	.099
Tks, spot NY ......lb.	.144	.14½	.088	.15½	.07¼	.094
Coast, tks ......lb.	.14¼	.14⅜	.087	.14¾	.06⅞	.094
Coconut, edible, bbls NY..lb.	.10	.10¾	.04	.12	.04¾	.10¾
Manila, tks, NY ......lb.	...	.04	.03¾	.06¼	.02⅝	.03¾
Tks, Pacific Coast ...lb.	.03½	.03¾	.03½	.06	.02¼	.02½
Cod, Newfoundland, 50 gal bbls ......gal.	.35	.36	.36	.38	.34	.40
Copra, bgs, NY ......lb.	...	.0210	.02	.038	.0012	.021
Corn, crude, tks, mills ....lb.	.08⅞	.09	.08⅞	.11	.03½	.09½
Refd, 375 lb bbls, NY ..lb.	.11½	.11¾	.11½	.14	.05¾	.12
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls, NY ......lb.	.05¼	.06¾	.04½	.06	.02¾	.05½
English, brown, bbls, NY lb.	.04¾	.05½	.04¾	.06½	.03¾	.05⅜
Greases, Yellow ......lb.	.06⅛	.06¼	.05	.06⅝	.02⅜	.05⅛
White, choice bbls, NY lb.	.06¾	.07⅞	.05¼	.08½	.02¾	.05⅝
Herring, Coast, tks ......gal.	.30	Nom.	.23	.32½	.15	.23
Lard Oil, edible, prime ...lb.	...	.16¾	.09¾	.17	...	.09¾
Extra, bbls ......lb.	...	.11¾	.08½	.11¾	.07	.08½
Extra, No. 1, bbls ......lb.	...	.11	.08¼	.11	.06⅜	.08¼
Linseed, Raw, less than 5 bbl lots ......lb.	...	.103	.095	.105	.101	.105
bbls, c-l spot ......lb.	...	.095	.087	.097	.087	.101
Tks ......lb.	...	.089	.081	.091	.081	.095
Menhaden, tks, Baltimore gal.	.28	.30	.25	.35	.15	.25
Refined, alkali, drs ....lb.	.073	.077	.061	.077	.052	.069
Tks ......lb.	...	.067	.055	.069	.046	.061
Light pressed, drs ......lb.	.067	.071	.055	.071	.046	.057
Tks ......lb.	...	.061	.049	.063	.04	.05
Neatsfoot, CT, 20° bbls, NY ......lb.	...	.16¼	.16¼	.16½	...	.16½
Extra, bbls, NY ......lb.	...	.11¼	.08½	.11¼	.07	.08½
Pure, bbls, NY ......lb.	...	.11¾	.11¾	.12	.12	.13
Oleo, No. 1, bbls, NY ....lb.	...	.12½	.10¾	.14½	.06	.11½
No. 2, bbls, NY ......lb.	...	.11½	.10	.13¾	.05⅜	.11¼
Olive, denat, bbls, NY ...gal.	.83	.84	.82	.95	.76	.90
Edible, bbls, NY ......gal.	1.65	1.80	1.55	1.80	1.55	1.90
Foots, bbls, NY ......lb.	.08	.08¼	.07⅛	.08¾	.06½	.07½
Oticica, bbls ......lb.	.13¾	.14¼	...	...	...	...
Palm, Kernel, bulk ......lb.	.0425	Nom.	...	...	...	...
Niger, cks ......lb.	.04½	.04¾	.034	.05¾	.031	.03¾
Sumatra, tks ......lb.	...	.04¼	...	...	...	...
Peanut, crude, bbls, NY ..lb.	...	.04¼	...	...	...	...
Tks, f.o.b. mill ......lb.	...	.10½	.10½	.10¾	.06½	.10¾
Refined, bbls, NY ......lb.	...	.13	.12½	.14	.07½	.12½
Perilla, drs, NY ......lb.	.08	.08¼	.07¾	.08¾	.08¼	.09⅝
Tks, Coast ......lb.	.074	.075	.07¼	.08¼	.07½	.09
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.085	.087	.08	.09	.08	.082
Denatured, drs. NY ...gal.	.42	.43	.40	.53	.37	.44
Red, Distilled, bbls ......lb.	.09⅛	.10⅛	.07⅜	.10⅛	.06⅞	.08⅜
Tks ......lb.	...	.08¼	.06½	.08¼	.06	.06½
Salmon, Coast, 8000 gal tks ......gal.	.35	Nom.	.25	.35	.15	.21
Sardine, Pac Coast, tks ..gal.	...	.30	.24½	.37	.13	.25
Refined alkali, drs ......lb.	.073	.077	.065	.079	...	...
Tks ......lb.	...	.067	.06	.069	...	...
Light pressed, drs ......lb.	.067	.071	.055	.073	...	...
Tks ......lb.	...	.061	.049	.063	...	...
Sesame, yellow, dom ......lb.	.13	.13½	.12¼	.13¾	.07½	.13¼
White, dos ......lb,	.13	.13½	.12¾	.13¾	.08	.13¼
Soy Bean, crude						
Dom, tks, f.o.b. mills ..lb.	...	.093	.08	.10	.06	.08
Crude, drs, NY ......lb.	.099	.103	.086	.11	.066	.09
Refd, bbls, NY ......lb.	.104	.113	.091	.115	.071	.102
Tks ......lb.	.098	.103	.08	.10½	...	...
Sperm, 38° CT, bleached, bbls NY ......lb.	.099	.101	.099	.101	.106	.11
45° CT, bleached, bbls, NY ......lb.	.092	.094	.092	.094	.099	.103
Stearic Acid, double pressed dist bgs ......lb.	.11¼	.12¼	.10	.12¼	.09	.11
Double pressed saponified bags ......lb.	.11¾	.12¾	.09	.12¾	.09	.10
Triple pressed dist bgs ..lb.	.14	.15	.12¾	.15¼	.11¾	.13¾
Stearine, Oleo, bbls ......lb.	.09¼	.09½	.09¼	.12½	.05	.10⅝
Tallow City, extra loose ..lb.	...	.06⅝	.05⅜	.07	.07⅞	.05⅜
Edible, tierces ......lb.	...	.08	.07¼	.08½	.04¾	.07¼
Acidless, tks, NY ......lb.	...	.10¼	.07½	.10¾	.06	.07½
Turkey Red, single, bbls ..lb.	.07½	.08	.07½	.08	.07½	...
Double, bbls ......lb.	.12½	.13	.12½	.13	.12½	.13
Whale:						
Winter bleach, bbls, NY lb.	.081	.083	.07	.083	...	.072
Refined, nat, bbls, NY ..lb.	.077	.083	.064	.081	.064	.07

THE CHEMICAL MARKET-PLACE

Local Suppliers

A selected Directory of responsible manufacture-sales agents, and jobbers who maintain spot stocks of chemicals, dye and tanstuffs, gums, naval stores, paint and fertilizer materials and similar products.

RHODE ISLAND

MASSACHUSETTS

Index to Advertisers

"We"—Editorially Speaking

Our Tercentenary Supplement, "Chemical Industry's Contribution to the Nation," certainly has had a whole salvo of repercussions, but by far the most amusing is a letter from a young lady in Pittsburgh addressed to—

Mr. John John Winthrop, Jr.
Care Chemical Industries,
25 Spruce Street,
New York City.

❖❖❖❖

No longer can Carl Hazard rail against the lack of the good old sex appeal in chemical advertising. Jacques Wolf & Co. have real "it" in their advertisement of their Soluble Silk Oil W-814 in last month's CHEMICAL INDUSTRIES (page 538).

❖❖❖❖

Col. Weeks out in Bound Brook has been conducting a series of exciting experiments on his front lawn. He decided this season to replace the traditional lawn mower with a combined grass cutter and fertilizer spreader in the form of a male goat. However, the expanse of grass proved too much for one goat's omnivorous appetite, so he secured a helper in the form of a second male goat of circus training. The results have been entertaining, and embroiling; and the latest report is that there is one goat for sale and one goat to be sub-let, while there is a customer for one good power lawn mower in the market.

❖❖❖❖

From the Professor of Analytical Chemistry in a well known Eastern University our subscription department recently received the following message: "While CHEMICAL INDUSTRIES is undoubtedly most useful to one whose work is along commercial lines, I do not feel that we should be justified in subscribing to it here, where our interests are almost entirely in the academic and research fields." Which seems to us an extremely interesting commentary on our leading editorial two months back "Executives and Technicians," and maybe one reason why some research doesn't always pay.

❖❖❖❖

From our fifth story office windows, we can look catercorner across the street, into the offices of a firm which has just ordered a copy of the new 1935 edition of the *Chemical Guide-Book.* Fame is such that their order bore the endorsement: "As per your 'ad' in the *Manufacturing Chemist*, of London, England."

❖❖❖❖

Recent developments in labor legislation certainly make extremely timely this contribution to our own "I-told-you-so Department," reprinted from an editorial in CHEMICAL INDUSTRIES, July, 1934: "Wages like profits come out of production, and the failure of N.R.A. to restore prosperity by transferring income from profit-earners to wage-earners is apt to be one of the economic fallacies of the New Deal most promptly disproved. Ultimately the workers themselves must decide how much income they wish to sacrifice for how much leisure. To date the trade unions have been more insistent on maintaining scales than shortening hours. This has always been true, and labor would undoubtedly be the strongest opponent of the compulsory 40 hour week, if wages were to be cut proportionately. Accordingly, adjustment of wages and hours had best be postponed till business volume, dollar values, and taxes are all upon a sounder, more stable foundation."

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It may very well be that no man is a hero to his own valet, but one of the major executives up at Cyanamid is obviously deified by his secretary, for she writes: "Mr. ...... is out of town, but on His return I am sure that He will give this matter His very prompt attention."

❖❖❖❖

A well assorted group of chemical men at lunch the other day turned to the ever-fascinating topic of inflation. Said an operating executive: "As I understand it, the problem is very simple. If you and I spend more than our income long enough, we go into bankruptcy. If a country spends more than its income, it inflates."

"What I should like to know," put in the consultant in the group, looking straight at the college professor, "is what happens to a university when it spends more than its income?"

"That's simple too," the treasurer interrupted, "they hand out honorary degrees."

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Which, of course, has nothing whatever to do with the doctorate in science conferred last month by Princeton upon the most recent winner of the Nobel Prize in Chemistry, a deserved honor, awarded because of the confirmed belief that "Princeton knows everything about heavy hydrogen except Urey!"

❖❖❖❖

Which, in turn, reminds us that after all the boldly placarded wise-cracks about the New Deal, joyfully displayed by old grads in reunion at hundreds of institutions of higher learning, were carefully cataloged, the prize was awarded to the banner of Princeton, 1915—"Roosevelt Went to Harvard, Of Course." Which, once again, makes us a little proud that he was never a chemical executive.

Fifteen Years Ago

From our issues of July, 1920

J. F. Wischhusen, formerly manager, Beck-Van Sielen, sails for Denmark.

J. R. M. Klotz, Newport Chemical Works; Dr. Samuel Isermann, Chemical Company of America; and D. H. Litter, Calco Chemical, attend conference at Washington with the Commissioner of Internal Revenue.

C. C. Concannon, now head, Chemical Division, Bureau Foreign and Domestic Commerce, but then with Takamine, reports on his return to New York that Japan is overstocked with chemicals.

R. C. Jeffcott, Calco Chemical, returns from extended trip to Europe.

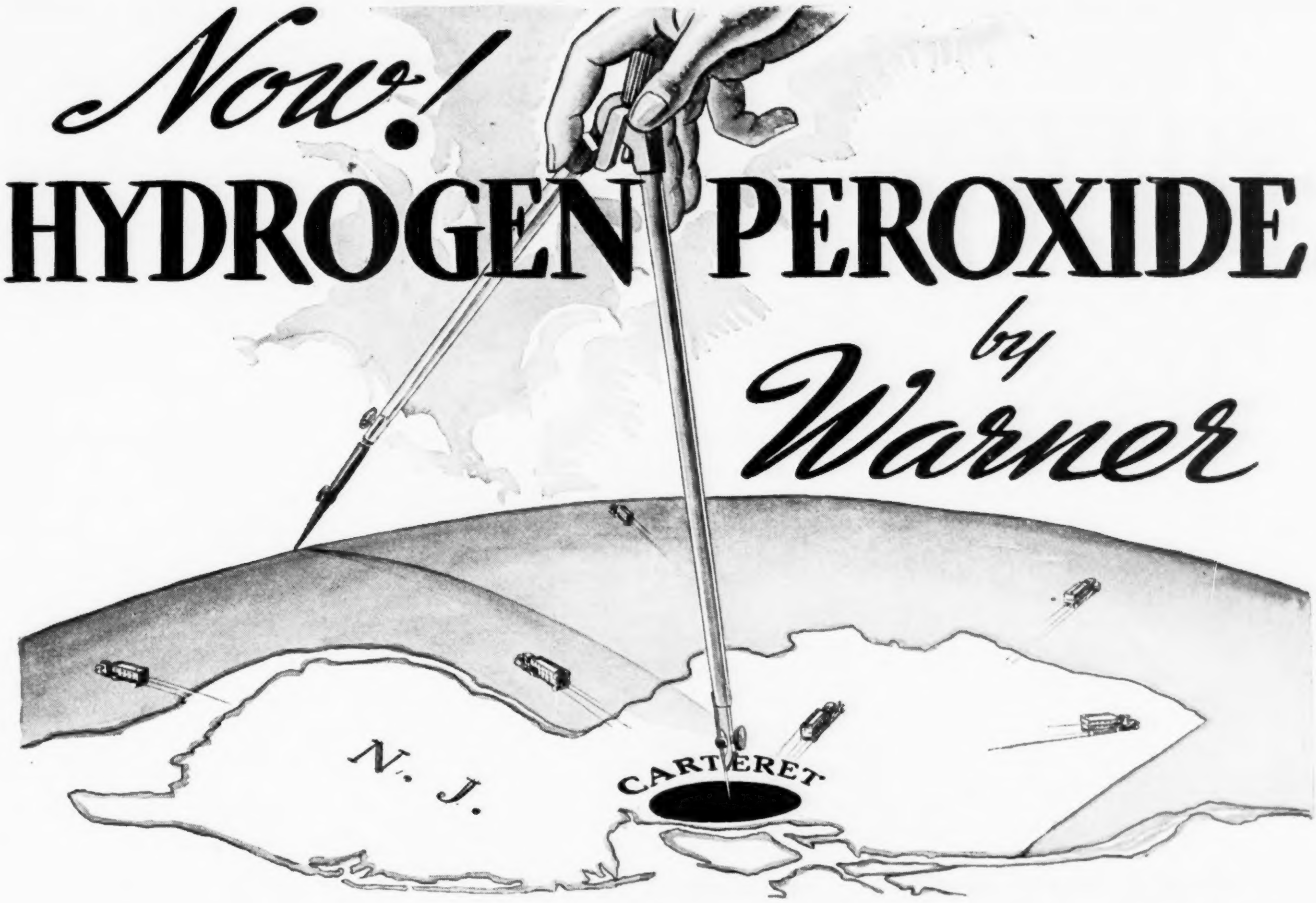
Barrett Co. in association with Paix & Co. plan new plant in France.

Wilbur White Chemical Co. plans manufacture of photographic chemicals.

Chicago Chemists' Club holds first annual meeting, electing William Hoskins president.

Texas Gulf Sulphur completes agricultural sulfur plant at El Paso, Texas.

Now! HYDROGEN PEROXIDE *by Warner*



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Quick delivery by tank truck within a radius of 120 miles from Carteret, N. J.

Every step in the production of Warner Hydrogen Peroxide for all industrial and technical uses is under constant Warner control. From the ownership of the raw material sources to the delivery of the finished product, Warner carefully guards the purity, stability and uniformity at all times.

Erected only after several years of research and developement, the Warner Hydrogen Peroxide facilities at Carteret, N. J. are second to none in the country and make possible immediate delivery in carboy, barrel or tank truck within a radius of 120 miles which covers a vast section of the Middle Atlantic textile industry.

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